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FIRST ANNUAL REPORT

OF THE

STATE BOARD OF HEALTH

OF

NEW YORK.

BOSTON MEDICAL LIBRARY ASSOCIATION

TRANSMITTED TO THE GOVERNOR DECEMBER 1, 1880.

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CONTENTS.

PAGE.

REPORT OF THE BOARD 7–24
ORGANIZATION OF THE BOARD 7
ITS BY-LAWS AND STANDING COMMITTEES 7
MEETINGS OF THE BOARD 9
REVIEW OF THE PUBLIC HEALTH LAWS OF THE STATE 9
The law creating the State Board of Health 10
Laws relating to Registration and Vital Statistics 10
Manual of Laws relating to Public Health in the State 10
REGISTRATION AND THE BUREAU OF VITAL STATISTICS 11
LOCAL SANITARY GOVERNMENT 12
Local Boards of Health 12
City Boards of Health 12
PREVENTABLE AND PREVALENT DISEASES 14
Small-Pox 15
Diphtheria 17
In Geneva 17
In Fulton and Hamilton Counties 18
In Otsego County 18
In Oneida County 18
Dysentery, and a common cause of it 19
Malaria, and preventive measures against it 20
PURITY OF WATER SUPPLIES FOR DOMESTIC USE 21
SCIENTIFIC INVESTIGATIONS AND EXPERT SERVICES 21
FINANCIAL STATEMENT — EXPENDITURES 22

APPENDIX.

Report of the Executive and Finance Committee 25
Report of the Committee on Registration and Vital Statistics 28
Report of the Committee on Quarantine — External and Internal 31
Report of the Committee on Public Institutions 55
Report of the Committee on Sanitary Legislation, Rules and Regulations 67
Discourse by Mr. Brooks, "What the State owes to the People." 75
Abstract of the Minutes and Transactions of the Board 86
Report of the Secretary of the Board 93

REPORTS OF PREVALENT DISEASES.

Reports on Diphtheria:
In Fulton and Hamilton Counties 105
In Otsego County 132
In Waterville 136
In Chautauqua County 138
In Schuyler County 139
In Geneva 141
Reports on Dysentery:
On Long Island 152
In Westchester County 172
Records of fatal house-epidemics 175
Reports on Malarial Diseases:
In Columbia and Dutchess Counties 181
The Abandoned Canal Nuisances 183
Petition of Citizens of Schenectady 189
Petition of Citizens of Yonkers 190
Malaria and a Nuisance at Hart's Falls 190
Reports on Small-Pox:
In Albany, Rensselaer, Montgomery, Fulton and Washington Counties .. 192

THE STATE BOARD OF HEALTH OF NEW YORK.

MEMBERS OF THE BOARD.

State Commissioners of Health; appointed by the Governor and Senate.

HON. ERASTUS BROOKS, West New Brighton, Richmond Co.
J. SAVAGE DELAVAN, M. D., Albany.
ELISHA HARRIS, M. D., New York, P. O. address, Albany.

Appointed by the Governor from the Health Commissioners in Cities.

EDWARD M. MOORE, M. D., Rochester.
PROF. CHARLES F. CHANDLER, Columbia College, New York.
JAMES G. HUNT, M. D., Utica.

Ex-Officio Members.

WM. M. SMITH, M. D., Health Officer of N. Y., Quarantine, S. Is'd.
JAMES T. GARDENER, Sup't of State Survey.
HAMILTON WARD, Attorney-General.

OFFICERS OF THE BOARD.

President,

DR. EDWARD M. MOORE, Rochester.

Secretary,

DR. ELISHA HARRIS, Central Office of the Board, Albany.

State Superintendent of Registration and Vital Statistics,

DR. ELISHA HARRIS, as Secretary of the Board.

STATE OF NEW YORK.

No. 29.

IN ASSEMBLY,

JANUARY 20, 1881.

FIRST ANNUAL REPORT
OF THE STATE BOARD OF HEALTH.

STATE OF NEW YORK:

EXECUTIVE CHAMBER,
ALBANY, *January* 20, 1881.

To the Legislature:

Herewith is transmitted the First Annual Report of the State Board of Health, ending December, 1880.

ALONZO B. CORNELL.

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626

REPORT.

To His Excellency, ALONZO B. CORNELL, *Governor:*

SIR: — By the law to establish the State Board of Health, passed May 18, 1880, the Board is required to report to you upon the vital statistics, sanitary condition, and prospects of the State, and to communicate such other information, and suggest such legislative action and precautions as shall be deemed proper for the protection of life and health.

The members of the State Board of Health, as provided by law, proceeded to organize their official duties immediately upon taking the oath of office, the 29th of May.

ORGANIZATION OF THE BOARD.

Membership. — The law creating the Board provides that three State Commissioners of Health, the Attorney-General, the Superintendent of State Survey, the Health Officer of the port of New York, also three other persons designated and appointed by the Governor, and who already are commissioners of health in organized boards of health in cities, shall constitute the Board of Health of the State of New York. The organization of this Board was effected on the 29th of May, by the unanimous election of Dr. Edward M. Moore, of Rochester, President, and Dr. Elisha Harris, of New York, Secretary. Having thus begun its organization, the Board convened again on the 5th of June, and adopted the following by-laws, and arranged a plan of duty in which all members were to participate, their labors being distributed among seven standing committees.

BY-LAWS, STANDING COMMITTEES, ETC.

First. The constitution of the Board is the law to establish a State Board of Health, passed May 18, 1880.

Second. In conducting the business of the meetings of the Board, the rules of the Assembly of New York, so far as applicable, shall be observed.

Third. The annual meeting of the Board shall be held on the second Wednesday in May.

Fourth. The quarterly meetings shall be held the second Wednesday of August, November and February, unless otherwise ordered by the Executive and Finance Committee.

Fifth. Special meetings shall be called at any time by the Secretary, upon a request in writing signed by five members.

Sixth. The Secretary shall file all papers, communications and reports addressed to the Board, or to him as Secretary, and shall acknowledge the same. Such papers or other matter as may be deemed proper for the purpose, he shall forward to the chairman of the appropriate committee, after filing the titles and memoranda, which shall be recorded in the Secretary's office. He shall record all accounts of expenditures ordered or made by the Board and its several members, and shall, before presenting any bill, account or voucher to the Comptroller, cause a copy of the same to be recorded in a book kept for that purpose, and shall have stamped upon each such voucher, account or bill, the audit and date, as the Executive and Finance Committee shall provide.

Seventh. With the approval of the Executive and Finance Committee, the Secretary shall make requisition upon the Comptroller for such stationery, printed forms, clerical labor, apartments and furniture as shall be needed for the use of the Board.

Eighth. No purchases shall be made, or expenditure incurred, except by order of the Board or of the Executive and Finance Committee; and the Executive and Finance Committee shall not have power to incur any indebtedness beyond the amount appropriated by law.

Ninth. The following Standing Committees shall be annually appointed by the President of the Board, and the President and the Secretary shall be members *ex officio* of the Committees:

(1.) An Executive and Finance Committee.
(2.) A Sanitary Committee.
(3.) A Committee on Registration and Vital Statistics.
(4.) A Committee on Sanitary Legislation, Rules and Regulations.
(5.) A Committee on External and Internal Quarantine.
(6.) A Committee on Public Institutions.
(7.) A Committee on Drainage, Sewerage and Topography.

Tenth. Whenever the Governor of this State, under section 8 of chapter 322, of the Laws of 1880, shall require the State Board of Health to examine into nuisances or questions affecting life and health in any place, it shall be the duty of the appropriate committee, under these by-laws, to take charge of the kind of nuisance or questions affecting life and health, as complained of, and said committee shall have all the necessary powers to make such examination, and shall report the

result to the Governor within the limits of the time which he shall have prescribed for such examination and report, and it shall be the duty of the President and Secretary to whom the communications of the Governor are sent, to refer the same immediately to such committee for their action.

Meetings.

The annual and quarterly meetings of the Board are devoted to current business and orders. Adjourned and special meetings are held at such times and places as the duties of the Board and the interests of public health require. Such meetings have been held in the city of New York, in Buffalo, and at Albany. An abstract of the proceedings of the Board at its several meetings will be found in the Appendix.

Public Health Laws.

In the earlier years of legislation in the State of New York, even in Colonial laws, the duty of guarding the public health and protecting life has been emphatically expressed in statutes, and by the endowment of local authorities with power to organize sanitary regulations in cities and towns. The intelligence, public spirit and commercial necessities of this State have from an early period in its history required, and by law provided, that contagious and pestilential diseases shall be so separated and quarantined as to save the community at large from exposure to them. The Quarantine Laws of New York are remarkable and instructive examples in this respect.

The spread of contagious fevers, small-pox and pestilent infection has been guarded against at the port of New York with peculiar care ever since the close of the Revolutionary war. The quarantine system of this State, as it was formerly administered, may have fostered the erroneous idea that only the few diseases which were specified in the laws needed to be guarded against; but, as at present administered, the quarantine regulations at the port of New York contribute to the protection of this State and of the entire country against pestilential contagions incident to immigration and maritime commerce. Yet the preventable causes of sickness and death which are found in all cities and populous towns, and which frequently burst into activity in unsuspected places in the rural districts no less than in cities, are of momentous importance to the people who are exposed to them, and they bear the same important relation to the people of the city and country at large as do the exotic causes of disease. Public health laws have become a necessity in every State and municipality, and sanitary regulations are necessary for every town and village, because there are sources of peril from various diseases and from causes of evil that require something more than individual efforts to secure even

personal and domestic health, and much more to protect the public health.

The population of New York now exceeds 5,200,000 of people. Over one-half of this population is domiciled in our 24 cities, and some 340 villages. Each city and incorporated village is presumed to have, and certainly should have, a local board of health. Most of them, however, have failed to organize an efficient sanitary system. Very few of the townships, now numbering upwards of 930, maintain boards of health, although a statute providing for such a board in every town, village and city, has been in existence for thirty years.

The State Board of Health has found it to be one of its first and chief duties to ascertain the causes for the neglect to organize and maintain local boards of health, and it has at the same time caused a careful review and abstract of the public health laws of the State to be prepared and published for the information and advice required in towns, villages and cities, in order to secure effectual action on the part of the proper local authorities, as well as to incite the necessary inquiry and public interest among the people.

Law creating the State Board of Health, chapter 322, *Laws of* 1880.—This law defines the duties of the State Board of Health, and places this Board in immediate correspondence with all local sanitary authorities in the State. It recognizes and requires that records of population — registration of deaths, births and marriages — and the record of prevalent diseases, shall be organized and steadily maintained throughout the State, and that the central bureau of such vital statistics shall be provided for in the State Capitol. Therefore, it became one of the first duties of the Board to lay the foundation for this important branch of the State sanitary system.

Chapter 512, *Laws of* 1880, *and chapter* 152 *of* 1847.—These laws, which specifically define the duties of city, town, village and county authorities in relation to the records of deaths, births and marriages, have been duly explained and distributed to 13,500 local officials, who are to be held responsible for compliance with them. These two statutes, and chapter 322 of 1880, will be found in the Appendix.

Manual of laws relating to public health. — The Board has found it necessary to prepare a compendium of the laws relating to public health, and a brief outline of model sanitary ordinances, regulations and orders adapted to the use of local boards of health in this State. In completing this important work, the expert aid of Wm. Packer Prentice, Esq., counselor to the New York City Health Department, has been associated with the constant counsels of the Attorney-General of the State.

To aid all health officers and other local authorities to organize their own duties, and lay the foundation for practical coöperation with the

State Board of Health and with each other, it has been found necessary to prepare the way for correct and efficient applications of existing laws relating to the protection of health and life, and to this end the Manual and model scheme of sanitary ordinances and regulations above mentioned has been placed within reach of every community in the State, by the wide distribution that has been given to them.

This Board, having found all these laws which relate to public health, in existence, and without arrangement and codification, may soon have occasion to suggest to the Legislature certain amendments, and, probably, some additional and simplified laws to meet urgent sanitary necessities. The report of the Standing Committee on Sanitary Legislation, Rules and Regulations, found in a subsequent section of this report, presents this subject with appropriate suggestions.

The legal determination and official description and judgment of what are nuisances against health must be regarded as of the greatest practical importance in the administration of public health laws. By the law constituting this Board, the Governor of the State may, upon the report of the Board, certifying the existence and nature of nuisances, "declare them to be public nuisances, and order them to be changed as he shall direct, or abated and removed." This Board has only begun its work in this important field. Most of the nuisances which it has described and recommended to be removed and prevented, are such as readily come under control of the local sanitary authorities; and were the local boards of health endowed with power both to determine and proceed against nuisances, sanitary improvement would be greatly facilitated. The manual of laws that has been distributed for the benefit of local authorities will, it is hoped, encourage and strengthen all health officers in their duties in this respect.

Registration of Deaths, Births and Marriages.—The Bureau of Vital Statistics.

The records of the sanitary condition of five millions of people and of the movements of this population, the registry of their mortality and the causes of death, the registry of prevalent diseases and a faithful record of all births and marriages, pertain to the Bureau of Vital Statistics. The necessities of sanitary service, and the interests of communities considered socially and physiologically, alike require that this registration in all its parts be complete, uniform in its methods, and faithfully attended to in all its details. With the registration of mortality and its various causes, and with the records of prevalent diseases, sanitary officers have constant occasion to concern themselves; but the other

two branches of vital registration are also essentially necessary in the study and establishment of the sanitary defenses of the people. This Board, upon its organization, found itself charged with the duty of devising a system of registration and vital statistics in accordance with the 7th section of its organic law. In the statements by its standing committee on this branch of the service, and by the Superintendent of vital statistics, as included in this report, will be found the chief conclusions which require immediate attention from the Legislature, and from the county, town, and other local authorities.

It is surprising and discreditable that a State, proud of its progress and civilization, as New York is, should until now have wholly neglected to devise and maintain a system of records of births, marriages and deaths. It is made the duty of this Board to secure thorough registration in all towns and counties of the State. The laws which the Board now finds in existence, one of which dates back to 1847, and others as enacted by the last Legislature, will be thoroughly tested, and if found too defective for the efficient working of a correct system, the facts will be in evidence of the necessity for such amendments of law as the Board may suggest. It is hoped that this practical test will be attainable during this winter's session of the Legislature.

Local Sanitary Government.

Local boards of health.—As it is a special characteristic of the Board of Health of the State of New York that it provides for constant intercommunication with local sanitary authorities of all ranks, the Board entered at once upon the duty of ascertaining the condition of these corresponding sanitary organizations, and it has been found that the local boards are in most of the cities and villages imperfectly organized, and that they labor under great disadvantages in the administration of the ordinary public health regulations. The cities of New York and Brooklyn are creditable exceptions to this rule, and it may be said of the Health Department of New York city that it is one of the most thoroughly organized departments of sanitary service of which we have knowledge. Towns have begun to organize their municipal boards of health, with promising results, under the law of 1850.

City boards of health.— With the exceptions above mentioned, the chief defect in the thorough operation of municipal boards of health consists of its want of such independence in councils and in action as is really necessary to efficient and economic work. The second great necessity which is felt in the administration of municipal boards of health, particularly in smaller cities of the State, consists in the want of adequate provision for sanitary engineering and other essential means of improvement in public works. This fact is illus-

trated in numerous complaints and petitions now filed with the State Board. In one of the interior cities, for example, there is absolutely no system of sewerage, and a small natural streamlet or creek, which flows through the whole length of the city, receives all the sewerage and night-soil that can be turned directly into its filthy stream, until at last, it passes under the Erie canal, and is emptied into the Mohawk river just above the pumping station whence the water is supplied to the inhabitants. The people appealed to their local board of health in vain, and the State Board can afford them no relief except by inducing the very reforms which the city authorities have stoutly resisted until now. In another city an open mill-stream which pursues a tortuous course through the length of the town, receives all the sewage and other filth that can be turned into it; yet for years the city ordinances have strictly prohibited such disposal of night-soil and sewage. The municipal board of health there finds itself without power to enforce its own requirements. There is ample evidence that the local board of health in every city and in every village needs to be so independent and untrammeled, that it shall secure, without hindrance, a faithful execution of sanitary ordinances, regulations and orders. Sanitary administration should be divorced from partisan dictation.

The steady growth of particular nuisances in a city that neglects sanitary laws and regulations is inevitable. Illustrations of this fact have been witnessed by the State Board in numerous instances, but nowhere, perhaps, more conspicuously than in the city of Buffalo, where, by the urgent request of the mayor and sanitary authorities, this Board inspected a noisome nuisance which has been produced in that portion of the great canal which extends from Black Rock around the city to the cattle-yards and railway grounds of the southern district of the city. For miles in length that canal has become a vast cess-pool, which cannot be remedied without energetic action and liberal expenditure. Creditable as it is to that city, to have commanded the counsels of eminent engineers as well as of the State Board of Health, the city government has not provided that the local board of health shall have adequate authority, and means to influence and guide the citizens in their adoption of comprehensive measures of sanitary protection. This Board notices with pleasure the increasing interest and public spirit, in the projection of works for the prevention of nuisances and the protection of health, in many of the cities.

There is a great deficiency in the registration of the causes of death in all excepting two or three of the twenty-four cities. The independence, in matters of local legislation, which cities acquire by virtue of their charters should carry with it the means of faithful compliance with the statutes relating to registration and vital statistics.

Preventable and Prevalent Diseases.

In devising a suitable system for the observation and registry of prevalent diseases, as required by the seventh section of the law that created this Board, the chief objective point is the discovery and control of preventable causes of disease, and premature mortality. Though there are diseases which seldom or never become prevalent, yet nevertheless are preventable, the Board has to deal with the common and the prevalent maladies which menace great numbers of lives. While rare and curious causes that destroy an occasional life engage the attention of the few scientific physicians under whose observation they chance to come, it is with the most prevalent, the most fatal and the epidemic kinds of disease, that physicians are most engaged and taxed in their professional labors; and in their experience they become deeply impressed with the significant import of the special and preventable causes of prevalent and destructive diseases. This Board has already received ample testimony from its voluntary medical correspondents, proving that physicians are more and more upon the alert to discover and accuse the local and preventable causes which they find contributing to the production and aggravation of the diseases they treat. Experience seems to warrant the remark that this Board is justly to be regarded as an organizing aid and a central bureau of the observers and promoters of preventive medicine.

The circle within which are described the truly preventable diseases and preventable sources of disease and premature death is ever enlarging, and it already includes a great number of maladies and a vast proportion of their causes which formerly were regarded as inevitable. The fact that twenty-five per cent of all the mortality in the State is *caused by only five* of the diseases which destroy life, and that fully one-third of the total sickness and mortality in the State is known to be preventable, must be regarded as an ample reason for making a systematic study and registration of the prevalent and preventable diseases. This duty has been commenced by the Board.

Though all arbitrary classifications of distinctive diseases, such as *preventable, inevitable, constitutional, climatic*, etc., will ever fail to disclose by such phraseology the real share that specially controllable or preventable causes have in their fatal issue, it will ever be true that prevalent diseases are closely allied to preventable causes. This Board will deem it a duty so to conduct its inquiries and register the observations and statistics relating to these diseases that the medical profession, the local sanitary authorities and the people shall be aided in their warfare against the chief foes of health. In this report the Board necessarily limits its notice of the prevalent diseases to a few instances of outbreaks that have been most instructive. These were

not the contagious diseases only, but, as in the outbreak of dysentery in one of the old villages of Long Island, and the prevalence of malarial fevers in numerous places, the productive causes were strictly local and external. No references can be made, in this report, to that greatest and least guarded destroyer, pulmonary consumption, but there can be no greater subject for public and domestic sanitary study and precautionary care.

In a year of unusual healthfulness, such as the present has been, the diseases that in various places in the State have been prevalent have destroyed a less number of lives than in the more unfavorable years. The seasons have been propitious. Malarial diseases alone have been more widespread than usual, the long-continued high temperature, and the droughts which extensive districts have endured being recognized as the general causes of the excessive prevalence of malaria. Its appearance in places long exempt from it, and the limits of its prevalence have become subjects of practical and important study in many parts of the State. The contagious and spreading diseases, which are domestic pestilences, have come under special examination of this Board during the past autumn to an unexpected extent, though they are prevailing only in limited districts at present. Other diseases arising from preventable causes have been investigated and such sanitary counsel as seemed most needed has been given to the local authorities and the inhabitants.

Small-Pox.— Late in the summer, when the small-pox gained a foot-hold in two wards of the city of Troy, it became the duty of the proper officers of the Board to call upon the health officers of all the surrounding cities and villages to take cognizance of their own inevitable exposure to dangers from the contagion developed among a moving and very careless and ignorant class of people. In Lansingburgh, Waterford, Cohoes, West Troy, and Amsterdam, the necessity for arousing the inhabitants to the duty of general vaccination was soon rendered obvious by the discovery of the presence of small-pox in each of those localities. Brief reports from each of them will be found in the appended statements.

Special reports upon the introduction and spread of small-pox in these places with an account of the method and results of vaccination from house-to-house, as appended to this report, are highly important; while the practical lessons conveyed in a brief record of an outbreak of this disease among a factory population in West Troy very completely illustrates how recklessly the loathsome contagion is spread among the common people, and how promptly great employers of such people may take action which shall stamp out an epidemic and provide an impregnable barrier against this dreaded disease.

The facts regarding the instance here mentioned are simply as follows: Eighty persons who were present at an evening party, wearing masks and indulging in hilarity for hours, on sitting down at tables unmasked, noticed in their company one of the dancers who had varioloid eruption upon her face. The hilarity of the crowd continued, and so did the dancing until the party broke up in the morning. The result of this culpable and horrid wantonness of exposure is told in a few words: "At times, varying from nine to fifteen days, from the date of the party, 22 of the 80 who were present were attacked with varioloid or variola in various degrees of severity. Five of the cases were very severe, but none of them were fatal." Now as these cases all occurred in families of employees of Messrs. Roy & Co., manufacturers of woolen goods, Messrs. Roy upon discovering the danger of not only their employees and the village, but also of the communities to which their goods might be sent, at once closed their mills, and ordered all persons, in whatever capacity employed by them, to be vaccinated, and also enforced their order that no person should continue in their employment without presenting a certificate from a physician showing they had been vaccinated, even though they might have had small-pox itself.

The result of this action is thus summed up: Twenty-two (22) cases had resulted from exposure in the dance-hall, and 11 persons had contracted small-pox from exposure to those 22 cases. Only one case occurred outside of the 22 persons and 22 families thus exposed. The outbreak suddenly and completely terminated with these events. The same emphatic orders that had secured such prompt sanitary precautions fortunately extended to the most thorough purification and disinfection of all dwellings in the place.

A brief report of the introduction of the disease into Amsterdam, and of events which have followed there, shows how important it is to establish the absolute sanitary barrier of general vaccination as well as positive domestic quarantine.

The Board, at one of its early meetings, directed that the subject of vaccination throughout the State shall receive the attention its importance requires. Up to this time, vaccination has not been well regulated by town and village health authorities as a sanitary duty. The matchless boon by which protection is secured against the most dreaded of all diseases of the human family still has to be urged upon the attention of all classes of inhabitants by the physicians and the few public-spirited people who justly deem it a philanthropic and public duty to prevent the terrible consequences of small-pox. This Board is very deeply impressed with its duty in regard to the whole matter of sanitary regulations and the necessary methods for exclud-

ing the presence or prevalence of small-pox within the limits of this State. This duty is unquestionably one of those which every State owes to its entire population. It is not necessary to argue this sanitary postulate; the main question is: How shall the State and local sanitary authorities so unite their endeavors, and so instruct and aid the people throughout the commonwealth in regard to vaccination, that every child, as well as all the adult population shall be and shall be kept thoroughly protected against small-pox? To this problem the State Board of Health is in duty bound to bring to bear all available resources of instruction and sanitary advice, ceaseless vigilance, and a complete and ever-ready preparation to secure the offering and acceptance of vaccinal protection in every community. Physicians are everywhere ready to conduct this branch of sanitary service in the same spirit that JENNER did. In concluding this statement, the Board would emphasize the fact that "what is to be administered is not a mechanical matter of routine and registration, but a system which, from beginning to end, and from center to circumference, requires in all its parts to be vitalized by the science of medicine." The State Board of Health will not appeal in vain to the medical profession to aid in, and freely contribute to, the organization and maintenance of such a system of perfect vaccination as shall effectually and continually protect the people of this State against small-pox.

Diphtheria.— In six widely separated regions of the State the Board has been called to advise in regard to the prevalence and suppression of this disease. Brief reports concerning this subtle and destructive malady in the places here referred to are herewith submitted.

Diphtheria at Geneva.— The outbreak and prevalence of diphtheria in Geneva and its vicinity, where nature has seemed to invite the affluent and the humbler inhabitants alike to make their homes and their streets the models of salubrity, and where this foe gained a foothold two years ago and upwards, has but recently disappeared. That eighty deaths occurred from this malady in that village of seven thousand inhabitants, in a period of fifteen months, is a lamentable fact which should incite to all the research and efforts that can be made to contribute to the protection of communities against pestilent poison which allies to its deadly work whatever aids it finds in neglect of purity of habitation and water supplies, and of the dwelling-grounds. The records of diphtheria in the beautiful village of Geneva, as presented by its medical officer of health, will be read and pondered with great advantage by all village and city authorities. That the tax payers of that village, upon discovering some of the sources of peril, expended at once several thousand dollars upon a beginning of systematic draining and sewerage is creditable to their intelligence and public spirit.

Diphtheria in Hamilton and Fulton counties.— On the 23d of September information was received by the Secretary of this Board that in a forest hamlet in the township of Arietta, Hamilton county, much anxiety and alarm existed among that hardy population in consequence of the threatening prevalence of diphtheria. As there was no physician and no organized sanitary authority in that township, immediate action was taken as provided by a previous provision and authorization of the Board. The Secretary, taking counsel with the Standing Committee in charge of such inquiries, visited the afflicted neighborhood, and after advising with the people, he committed to the nearest health officer in Fulton county the duty of carrying into full operation such details of sanitary inspection and instruction as needed to be given and repeated in the name of the Board. The full development of this investigation and the sanitary duties that ensued, as well as the comprehensive efforts to ascertain the latest and remotest results of careless habits of exposure to known causes of diphtheria, are so set forth in Dr. Beach's continuous narrative of his inquiries, that the Board would earnestly invite a critical perusal of this special history as presented in the Appendix of this report.

Diphtheria at Northville, Fulton county.—The sequel of the failure to find and advise the occupants of a sequestered forest shanty into which diphtheria found its way by a corpse-watcher from the hamlet of Arietta, eight miles away, is told by the health officer of Northville, in a few paragraphs that will be found appended to Dr. Beach's report.

Diphtheria in Otsego county.—Upon some of the loftiest hills of that hilly county diphtheria has made a record which must not be disregarded by school officers and teachers. From the report hereto appended, and by a personal inspection by the Secretary of this Board, it appears that from a mild case in a farm house upon summit land, there occurred such a series of malignant and fatal cases as would indicate the necessity of maintaining the local sanitary organization and all the available defenses which a town board of health and its "competent physician as health officer" can provide for a sparsely as well as for a densely populated township. It is creditable to the town of Morris that its leading citizens sought the counsel of this Board and promptly organized their township board of health, and extended their timely advice to the afflicted district in the adjoining town in which the disease had its outbreak. The prevalence of this malady in a district composed of parts of two towns, led the board of supervisors to consider the question of county interference to repress the epidemic, as provided by the last clause of chapter 512, laws of 1880.

Diphtheria in Waterville.—The recent prevalence of this malady, and its probable relations to a localizing condition in a particular district, in

the village of Waterville, are described by the physicians who studied the facts at the time.

Diphtheria spread from place to place.—The occurrence of diphtheria sporadically, or at least without any clue of personal or mediate communication of that attribute of it which is termed *contagious*, will not in the least invalidate the principle of duty in regard to the separation of the sick, and the disinfection of all that appertains to them. The report of an investigation into the presence and persistent foci of diphtheria in the village of Johnstown, hereto appended under the head of Fulton county, illustrates the importance of maintaining such efficiency of sanitary control of the known sources of the disease, as shall enable the local boards of health to repress, and if possible wholly prevent any deportation and spreading of infective material. The connection of a single tenement with a line of direct repropagation, now traced nearly a hundred miles, and the significant instance reported from Middlefield, Otsego, as traced back to a tenement in the village of Amsterdam, as reported by Dr. Lathrop of Cooperstown, correctly illustrates the necessity for such precautions.

Dysentery, and a common cause of it. — Upon the request of a few well-known residents of one of the healthful old villages of the south shore of Long Island, careful investigations were made, during the autumn, into the history and local causes of dysentery that had quite unexpectedly and suddenly occurred in a certain number of dwellings, in an exceptional way as regards the selection of the houses and premises in the older quarters of the village. The report of the course and results of the outbreaks, and of the progress thus far made in the investigation by this Board, will be found appended.

The fact that the well-water used by the occupants of dwellings, as seen on the diagram in the report above mentioned, is accused of causing dysentery in the fourteen families that suffered attacks, though not at first believed by the inhabitants, certainly admits of no doubt. It amply confirms the view which this Board has presented in the *second* and *third* of the model sanitary regulations, which it has unanimously adopted, and recommended for adoption by all local boards of health.

That older inhabitants of neighborhoods and particular dwellings, like those here referred to, in Suffolk county, should be slow to recognize the causes of their peril and suffering as coming from their wells and from cess-pools, privies and outhouses to and through the wells, is not surprising, for they see that one dwelling is taken and another left; and one portion of a street, one side of a street, or one portion of a town also is attacked by the hidden foe, and no other places and no other people harmed. These conditions, properly investigated, will lead to the true sources of the suffering.

The fact that the neighboring village of Babylon, L. I., had suffered severely, and by a singularly capricious visitation, from dysentery during the autumn of 1879 and the early part of the present year, yet had remained almost entirely exempt from all such bowel diseases during the entire period of its prevalence in the neighboring village eastward, is so instructive and important that a carefully prepared report upon the experience and the sanitary topography of Babylon, as far as the investigations have extended, is appended to the records and description of the Southampton experience.

The facts relating to a limited and instructive experience of dysentery, from the most definite local causes, in dwellings along certain low grounds in Tarrytown, are reported by the health authorities of that village, and are added in the appendix, for the lesson they teach.

Malaria and Preventive Measures against it.—The reports and various complaints concerning malaria and the local sources of miasmatic diseases outnumber all others received at the office of this Board. The local conditions which are accused as the immediate causes of the evils thus complained of may be summed up as consisting of undrained wet grounds, stagnant pools, and partially dried swamps and ponds, and unsewered or badly sewered premises. The most obvious fact is, that drainage and sewerage for health do not yet appear to be the first object which local authorities have in view in this class of public works, and the rules and regulations they enforce concerning them. This is true alike in cities, villages and the rural districts.

The statements appended concerning malaria and miasmatic diseases in Columbia and Orleans counties, from mismanaged ponds; in Chemung, Schuyler and Oneida counties, from pools and filth in abandoned canals; and in Schenectady and at Hart's Falls, from misuse and mismanagement of water courses, correctly set forth the nature and sources of some of the evils that are thus complained of in various parts of the State.

The action advised or taken for relief and prevention in these and similar cases need not be recited here, but it is our duty to call attention to the fact that the existing laws relating to general drainage of wet lands, etc., in this State are practically inoperative, and, further, that wherever they have been put into operation they have been the occasion for errors and abuses which the Legislature did not foresee. This Board has not yet advised any town or county to resort to these well intended but cumberous drainage laws.

Though the law creating the State Board of Health provides, in section eight, a mode of summary procedure to secure the protection of health and life in urgent cases, where nuisances are menacing the people, there is great need of an improvement in the general laws

relating to drainage and sewerage. The sanitary reasons for such works of local improvement and public utility should be definitely and officially stated, and all plans and methods for their construction ought to be inspected and approved, by competent sanitary and engineering authorities; while the works themselves should be ever under such supervision as shall insure their efficiency and economy. Drainage, sewerage, and whatever other works or proceedings must be ordered for preventing or overcoming the causes of miasmatic diseases, should be regarded as public works upon which sanitary and engineering science are to be required to define and approve the conditions necessary to secure the best results to the public health. The wide extent of malarial grounds in the State, the demonstrated part which wrongly constructed sewers and sewer-connections with houses are believed to have, in developing and aggravating numerous diseases, and the necessity for the adoption of a correct and well supervised system for the required drainage and sewerage of cities, towns and neighborhoods, render it important to provide suitable laws and administrative methods for this branch of sanitary improvement and public health works.

Purity of Water Supplies for Domestic Use.

The want of adequate laws for preventing the pollution of streams, wells and other sources of supply of water is equalled only by the general neglect of the duty to avoid the domestic use of sanitarily impure and defiled water. The duty of providing pure supplies and of maintaining necessary local regulations to prevent the sources of defilement is now under discussion in various parts of the State, and is receiving the special attention of this Board and the local authorities with whom it is in correspondence. In furtherance of the design to make good use of all existing laws for sanitary protection, the Board has issued to all local authorities a proposed form of sanitary regulations upon this subject. But more than this will be needed.

Scientific Investigations and Expert Services.

In accordance with section 10 of the Act creating the Board, it has been expedient to engage the skilled services of a few persons from time to time, and to defray the necessary traveling and other expenses of expert investigators and other assistance. These expenses, however, amount to only a moderate sum, as shown in the following statement, and in the detailed report of the Executive and Finance Committee. The Board believes that it will be desirable, indeed quite necessary, in the prosecution of most important investigations, and in lend-

ing its aid suitably to meet the requirements of the Public Health Service, especially in regard to the requests from local boards of health and from other authorities and citizens, to enlarge this line of expenditure. The Board pledges itself to use its best endeavors to make all such services eminently worthy of the State, while it shall keep its undertakings strictly within its established rules of economy and accountability.

Financial Statement.

As required by the 11th section of the law creating this Board a "detailed statement of the Comptroller of all moneys paid out by, or on account of, the State Board, and a detailed statement of its manner of expenditure" from the date of organization to the 1st of December, 1880, is herewith submitted.

The total expenses of the Board from the beginning of its existence to December 1, are classified as follows :

Printing and stationery	$1,335 66
Postage and postal cards	256 00
Scientific and expert services	725 00
Salaries and wages	1,867 22
Travelling and other necessary expenses of members of the Board while on duty	383 45
Miscellaneous expenses, including telegraphing	28 90
Furniture	94 59
Total	$4,690 82

The report of the Executive and Finance Committee of the Board, to December 1, will be found appended. The Board would embrace this opportunity to state that the scrupulous attention which its wants have received at the office of the Comptroller of the State has not only carefully guarded its finances, but facilitated the duties of the Secretary, and suitably provided for the Board's necessities in all matters of necessary expenditure.

In the various reports and statements hereto appended will be found ample evidence that the local sanitary officers in various parts of the State are already coöperating with this Board in a cordial and useful way. Doubtless it will be found that the plan provided in section 9 of the organic law of this Board for this coöperation may usefully be extended in such manner as to provide for the hearings and deliberative investigations of various matters arising in proceedings for sanitary improvements, in which the people in every city and village will find themselves interested concerning the reasons and methods of

sanitary service. The Board's work, as at present organized, has reached the ground upon which there should be ceaseless investigation and care of local causes of miasmatic diseases, also of the interests of health and life as they are affected by the common supplies of water for domestic use, likewise of safeguards against poisons, adulterations and the danger from fluids used in common lighting, and also of the sanitary wants of public institutions and places of assemblage; while by the general registration of vital statistics, the dissemination and practical application of sanitary knowledge, and by the maintenance of its central office in a state of complete readiness and efficiency, this Board must endeavor to extend its coöperation, and offer the most useful information and counsel whenever local sanitary officers, or the people of any community seek such aid in preserving life and health.

The State Board of Health is required to take cognizance of the interests of health and life of the people of the State, and to "make inquiries in respect to the causes of disease, especially of epidemics, and investigate sources of mortality, the effects of localities, employments, and other conditions upon the public health." In doing this it has been made necessary, and is a duty of this Board to obtain, collect, and preserve whatever information it shall need in regard to deaths, diseases and health, in order to contribute to the promotion of health and security of life of the people. Deeply impressed with the importance of these duties this Board respectfully submits its first report with the various documents that are hereto appended.

Respectfully submitted, by order of the Board;

EDWARD M. MOORE, *President.*
ERASTUS BROOKS,
WM. M. SMITH,
CHARLES F. CHANDLER.
HAMILTON WARD,
J. SAVAGE DELAVAN,
JAMES G. HUNT,
JAS. T. GARDENER,
ELISHA HARRIS, *Secretary.*

OFFICE OF THE BOARD OF HEALTH,
ALBANY, *Dec.* 1, 1880.

APPENDIX.

Report of the Executive and Finance Committee.

Statement of Warrants drawn by the Comptroller on account of the State Board of Health of New York, from May 29th to November 30th, inclusive.

Printing and Stationery.

1880.			
July	12.	E. H. Bender's Son, for blank books	$16 00
"	17.	Samuel Raynor & Co., for stationery (envelopes)..	76 75
"	17.	Albany News Co., for stationery (envelopes)	22 95
"	28.	Weed, Parsons & Co., printing	93 50
Aug.	2.	J. J. Little & Co., printing and electrotypes....	372 33
"	10.	F. S. Hasbrouck & Co., printing, stationery, etc..	12 35
"	10.	Argus Company.....	110 75
"	16.	R. K. Quayle, one steel plate note-heading	30 00
Sept.	30.	J. J. Little & Co., 2,100 postal card-schedules ...	27 00
"	30.	J. W. Wadsworth, Comptroller, bill of stationery,	153 28
Oct.	30.	J. J. Little & Co., electrotype headings and printing	24 50
Nov.	5.	E. H. Bender's Son, stationery	7 75
"	9.	Samuel Raynor & Co., for envelopes.....	9 00
"	13.	Argus Company, for printing, binding, etc	366 50
"	18.	R. K. Quayle, for printing and plate work	13 00
			$1,335 66

Postage.

June	24.	For postage stamps	$170 00
July	8.	For postal cards	20 00
Oct.	18.	For postage stamps	31 00
Nov.	23.	For postage stamps	35 00
			$256 00

Scientific and Expert Services.

Sept. 25.	Wm. Packer Prentice, preparation of Manual, etc.,	$500 00
" 25.	John C. Collins, clerical and expert services on Manual, etc	75 00
" 25.	Julius W. Adams, Civil Engineer, for expert services	150 00
		$725 00

Salaries and Wages.

June 29.	Dr. Elisha Harris, Secretary, for salary from May 29th to June 30th, inclusive	$274 00
July 31.	Robert Nelson, salary as clerk from June 23d to August 1st	103 22
Aug. 2.	Dr. Elisha Harris, Secretary, salary month of July	250 00
Sept. 1.	Dr. Elisha Harris, Secretary, salary month of August	250 00
" 1.	Robert Nelson, salary as clerk month of August,	80 00
Oct. 1.	Dr. Elisha Harris, Secretary, salary month of September	250 00
" 1.	Robert Nelson, salary as clerk month of September	80 00
" 30.	Dr. Elisha Harris, Secretary, salary month of October	250 00
" 30.	Robert Nelson, salary as clerk month of October,	80 00
Nov. 24.	Dr. Elisha Harris, Secretary, salary month of November	250 00
		$1,867 22

Travelling and other necessary expenses of members of Board while on duty.

July 13.	Dr. E. M. Moore, expenses as member of Board,			$49 74
" 17.	Dr. J. S. Delavan,	do	do	30 59
Aug. 2.	Dr. James G. Hunt,	do	do	53 02
" 3.	Prof. Chas. F. Chandler,	do	do	42 00
" 11.	Erastus Brooks,	do	do	46 85
" 11.	Dr. Wm. M. Smith,	do	do	9 60
" 11.	Dr. Elisha Harris,	do	do	98 35
Sept. 25.	Hon. Hamilton Ward,	do	do	20 30
" 30.	Dr. J. S. Delavan,	do	do	16 50
Oct. 13.	Prof. Jas. T. Gardener,	do	do	16 50
				$383 45

Miscellaneous Expenses (*including Telegraphing*).

Aug.	10.	Dr. Elisha Harris, Secretary, for miscellaneous expenses	$28 90
			$28 90

Furniture.

July	21.	F. S. Hasbrouck & Co., for stationery (furniture),	$57 59
Aug.	3.	R. K. Quayle, seal and press	30 00
Nov.	10.	Wm. H. Burton & Co., for tripods for maps	7 00
			$94 59
		Total to December 1, 1880	$4,690 82

The above report includes all the expenditures of the Board, in general and in detail, from the organization of the Board in May, 1880, to the 1st of December, 1880, when the law requires the report to be sent to the Governor.

(Signed) ERASTUS BROOKS,

Chairman of the Committee.

REPORT OF THE STANDING COMMITTEE ON REGISTRATION AND VITAL STATISTICS.

This Committee, in presenting its first report, would premise by saying that it has regarded the duties intrusted to its supervision as involving two distinct branches of labor; namely:

First. The correct and thorough registry and tabulation of the movement of the population of the State, as to its increase by birth, its extension by marriage and its decrease by death:

Second. The faithful picture of those diseases which have made up the death rate of the year, with a review of reported epidemics, either already investigated or in process of study; their character, location and severity, together with the measures advised for their suppression or prevention in the future.

To the accomplishment of these ends your committee has labored, and although but a short period has elapsed since the commencement of the work, enough has been accomplished in inaugurating the organization of sanitary reform in registration, and in creating a steadily increasing interest amongst the medical profession and people of the State, to encourage it in the further prosecution of its work.

Immediately after its organization, the committee proceeded to carry out the directions of the Board as ordered at its meeting in New York, June 5, 1880, as follows:

To issue a circular to clerks of school districts, town and county clerks throughout the State, calling their attention to the provisions of chapter 152, Laws of 1847, providing for the registration of births, marriages and deaths.

To prepare the necessary methods, forms and rules for regulating the issue and use of "transfer permits" for the transportation of dead bodies, in accordance with section seven of the law creating the State Board of Health.

To prepare the necessary methods and forms for obtaining and preserving records of births, marriages and deaths throughout the State, together with the registration of prevalent diseases, according to section seven of the same law.

These were duly prepared, adopted by the Board, and ordered printed. An edition of 14,000 of each sample form, and of the circular and laws, was issued with the approval of the Executive and Finance Committee.

The forms are six in number; No. 3, the certificate of death, being duplicated and filled out as a guide to the persons making the returns. These circulars, forms and laws, together with short instructions con-

cerning them, were issued as rapidly as possible to the following official and professional persons entitled to receive them:

To 24 City Boards of Health.
To 331 Presidents of Village Boards.
To 163 Village Boards of Health (special).
To 59 Clerks of Boards of Supervisors.
To 11,240 Clerks of School Districts.
To 933 Town Supervisors.
To 933 Town Clerks.
To 400 Physicians and officers of Health.

This work, commenced in July, was finished about September 1st, and the proper authorities were also provided with sample headings for books of registry to be adopted throughout the State. With a view to the commencement of registration of prevalent diseases, postal card-schedules were issued to the number of 350 for each month, beginning with June. These were distributed to health officers and physicians in the chief villages throughout the State, together with a circular inviting co-operation with the work of the Bureau of Vital Statistics. These cards are to report the total number of deaths from all causes, and by each of the more important ones during the month, with a list of prevalent diseases, and brief sanitary observations. The returns received by this method have been a source of much valuable information, and have aided greatly in creating an interest in Vital Registration. The importance of a correct registration of prevalent diseases is generally admitted, and the relation of such diseases to meteorological influences. A system of recording prevailing diseases with reports of the meteorological changes during the period of observation was recently adopted in Albany county, and for a time carried into effect with excellent results. Some method of prosecuting such inquiries, it is believed, would prove useful in the system of Vital Registration adopted by the State Board of Health.

Agreeably to the Board's direction, the committee has acted, and has sown broadcast throughout the State, seed that it is to be hoped will bear good fruit in the future.

The system of Vital Registration as provided by the State Board of Health once adopted, and in full and complete operation, the advantage to the people of our State will be so apparent, that no opposition need be feared.

"An accurate basis of facts," (said the late Dr. Parkes,) "derived from a sufficient amount of experience, and tabulated with the proper precision, lies at the very foundation of hygiene as of all exact sciences," and to obtain this precision of record is the first duty of your committee.

The organization of local Boards of Health in every town, village and city throughout the State, acting in harmony with the State organization, is of the highest importance, and to the State Board of Health should be delegated the power to organize such authorities in localities where none exist. It may be that to the accomplishment of this end further legislation will be required; but once accomplished, results will prove that Vital Registration has for its chief end "the guarding and improvement of the public health, the saving and benefiting of human life, and will repay its cost a thousand fold."

With regard to the second branch of labor, the investigation of

epidemic diseases existing, or recently prevalent, throughout the State, the following schedule of the committee's work is presented: Epidemics of diphtheria in Geneva, Seneca County; in Hamilton, Fulton, Oneida and Otsego counties. Dysentery in various villages of the State; enteric fever in several localities; malaria at Hart's Falls, Rensselaer county and in numerous other places, as also a recent epidemic of small-pox in Troy, West Troy, Lansingburgh, Waterford, and Cohoes. Each of these epidemics has received the fullest attention. Complete records of their primary causes, severity and extension, with maps of localities and portions of territory affected with the diseases under consideration, are on file at the Bureau of Vital Statistics. Reports from health officers and local physicians accompany them, and will appear in full in the report of the Secretary of the State Board of Health; as also copies of all forms and circulars issued by this committee. The committee being authorized to expend $300 in prosecuting necessary inquiries, such expenditure has been made under the supervision of the Superintendent of Vital Registration, with the intention of discovering the preventable causes in the history of each epidemic. This investigation, as will be shown by the reports received, has been very thorough and satisfactory, and the thanks of the committee are due to numerous medical men and others throughout the State for their valuable assistance. "Obsta principiis," should be the motto of the sanitarian, and it seems of the highest importance to obtain from physicians in districts where epidemic or preventable disease is prevalent, records of the first inception of the disease, the causes of the first case. Oftentimes a threatened outbreak of a spreading and devastating pestilence can be crushed by opposing its very beginning. The best methods of such watchfulness in each and every village, town and city in our State should receive careful study. Information furnished to the people by means of concise circulars on the prevention of the spread of contagious and infectious diseases, as has already been done respecting diphtheria, by the Secretary of the Board, will be a very useful agency in accomplishing this most desirable end. Other methods will suggest themselves as the work of investigation progresses. At present the committee's labors have been chiefly inceptive to the organization of thorough and complete efficiency in this important portion of the duties of the State Board of Health.

(Signed) J. SAVAGE DELAVAN, M. D.,

Chairman of the Committee.

ALBANY, *Nov.* 27, 1880.

REPORT OF STANDING COMMITTEE ON QUARANTINE — EXTERNAL AND INTERNAL.

External Quarantine.

Originally, quarantine indicated an interval of forty days. In modern acceptation it is of undetermined length; and as the great highway of epidemics, through the ages past, has been by the sea, so quarantine has come to be considered applicable to ships arriving in port and suspected of being infected with infectious or contagious disease. The name has, consequently, come to be associated not only with a period of time, but with that of restraint and forbearance of all intercourse with the shore. It is comparatively but a few years since the practice of isolating persons, ships and their cargoes, for a considerable time, has been superseded by more enlightened and efficient methods of quarantine. It is fortunate for the interests of commerce, as well as of humanity, that quarantine has come to be expressive of isolation of the sources of infection and inhibition of communication, merely to furnish opportunity for disinfection from known or suspected germs of disease, and the establishment of hygienic conditions.

Erroneous opinions in regard to the origin and propagation of the dreaded disease that first aroused the fears of the people of the State, led to the passage of Quarantine Laws for the Port of New York, which subsequent experience proved to be inadequate.

A brief review of the history of these laws is prompted by a desire to illustrate the progressive tendencies of legislation adopted from time to time during the period embraced, and the greater success attending methods which have been practised under the light of accumulated experience and scientific investigations.

In 1758, the General Assembly of New York enacted that "All trading vessels, transports and others, having small-pox, yellow fever, or other contagious distempers on board; and all vessels coming from any place infected with distempers, shall not come into any of the ports or harbors of New York city, or nearer to it than the land commonly called Bedloe's Island, and shall be obliged to make quarantine there, or in such other place or places, for such time and in such manner as the Governor or Commander-in-Chief, by and with the advice of His Majesty's Council, shall deem proper and reasonable to direct and appoint," etc., etc.

The surprising omission in this law is the absence of any reference to, or dependence on, either medical advice or management. Indeed,

the "Governor, Commander-in-Chief, and His Majesty's Council" are made the quarantine officers of the port.

In 1784, the provisions of 1758 were substantially re-enacted, with the direction that "such quarantine shall be performed in such manner as the Governor or, in his absence, the mayor of the city of New York may direct." And by that act the Governor was clothed with authority to appoint a physician with prescribed power and privileges. This is the first evidence afforded of a recognized necessity for medical skill and management in the administration of quarantine. Nevertheless, great laxity seems to have prevailed.

The theory of transmission by contagion seems to have so thoroughly taken possession of the minds of the observers of the time, that propagation by infection, through germs whose nidus was in the foul conditions of the bilge, or which had found a congenial home in the receptacles of filth among the timbers and in the obscure depths of vessels, was considered of secondary importance or wholly ignored. Consequently, for a series of years between 1784 and 1800, yellow fever was a periodical visitant of the port and city of New York.

By act of the Legislature of 1796, a health officer and seven commissioners were appointed, with certain well-defined powers, and a quarantine hospital was established on Governor's Island. The Governor, under this law, was authorized to indicate by proclamations the ports from which vessels should be quarantined.

In 1798, the laws in relation to quarantine were amended, but not materially changed. The epidemic of yellow fever which prevailed in New York city during the latter part of summer and early fall of this year, invading, as it did, other northern cities, with even greater virulence, created a feeling of alarm, which found expression in an excited demand for more efficient measures of protection from the pestilence which had hitherto passed all restrictions. Prompted by a feeling of insecurity from the proximity of the quarantine hospital at Governor's Island, an act was secured in 1799, "authorizing the common council and resident physician of the marine hospital to purchase a site on Staten Island for a boarding station and marine hospital." The site selected was at Tompkinsville and was occupied the same year.

For the first time, in 1801, vessels with cargoes from infected ports were prohibited approach to the wharves of the city. A new and alarming enemy appeared at quarantine this year in the character of typhus or ship fever. The plan of discharging vessels by lighters was now adopted for the first time.

By legislative act of this year, the Resident Physician of the Marine Hospital, the Health Officer of the Port, and the Health Commissioners, before referred to, were constituted a Board of Health for the city of New York. The infectious character of yellow fever seems now to have been recognized in the treatment of vessels and localities. Cargoes were lightered from suspected ships, and the vessels themselves were cleansed and fumigated before being discharged from quarantine.

The yellow fever epidemic of 1803 numbered upwards of six hundred victims in the city of New York. It became apparent that the "regulations" or management of quarantine was still defective or insufficient. Accordingly, in 1804, it was declared by legislative enactment, that "no vessel from an infected port should be permitted to approach within three hundred feet of the wharves of the city." And still later (1811), the unwise provision which required the Governor to designate by proclamation the ports from which vessels were subjected to quarantine, was superseded by a law which declared that "all vessels from Asia, Africa and the Mediterranean, and from the Bermudas, Bahamas and the West Indies, and any port south of Georgia, and all others having forty or more passengers on board, or having had sickness or death while in port or on the passage," should be subject to quarantine.

For nearly twenty years, or until 1822, New York was free from any epidemic of contagious or infectious disease. The epidemic of yellow fever in the year last named, although numbering five hundred cases, of which more than half were fatal, seems not to have been productive of any further legislation.

Early in the year 1831 that pestilence known as cholera, which had hitherto walked in the darkness of semi-barbaric Asia, invaded the eastern portion of Europe, and with rapid stride crossed the European continent and obtained a foothold in England in October of the same year. The rapid progress, unchecked by all restrictive measures, and the appalling mortality which attended this disease, aroused the authorities in this country to a due sense of the approaching danger. Congress was memorialized by the New York Board of Health to aid the local authorities in averting the fatal malady.

Although still more restrictive laws were enacted by the Legislature early in 1832, in July of this year cholera was announced as present in New York, and before the close of that month it had counted its victims by hundreds. No essential changes in either the "laws" or "regulations" appertaining to quarantine were made for several years.

Reference has been made to the transfer of quarantine in 1799, from Governor's to Staten Island.

The consciousness of safety thus secured by the cities of New York and Brooklyn, was by no means shared by the citizens of Staten Island. The fears of the populous communities on the eastern shore of the Island were greatly increased by an outbreak of yellow fever, which occurred in this locality during the summer of 1848, originating, as was generally supposed, from infected clothing which had drifted ashore from vessels lying in quarantine, adjacent to the hospital grounds. The next Legislature appointed a committee to remove quarantine to Sandy Hook, but they were unable to effect a purchase from New Jersey. In 1857 the quarantine commissioners selected Seguine's Point, on the south shore of Staten Island, and proceeded to erect piers, buildings, etc.

The people in the vicinity however, turned out in a body the

night of May 6, 1857, and burned every thing connected with the new station. Another application to obtain Sandy Hook also failed, and the old station at Tompkinsville was continued in use.

The well-remembered epidemic of yellow fever in 1856, which decimated the population of Bay Ridge and Fort Hamilton on the Long Island shore, and of the villages on the eastern shore of Staten Island, again stimulated the fears of the people in proximity to the quarantine establishment, to threats of violence, if the removal contemplated by the acts of 1849 and 1857 was not carried into effect.

No active measure, however, for the removal of quarantine had been adopted when, during the night of September 1, 1858, an organized mob of the citizens of the Island destroyed the extensive and commodious structures of the quarantine, including the hospitals, residences of the medical officers, and the numerous outbuildings; for which the county subsequently paid the State over $100,000, in accordance with the law making any county, within which property is destroyed by a mob, liable for the loss.

In March of the previous year (1857), by act of Legislature, radical changes were made in the laws of quarantine.

The New York State Commissioners of Emigration, hitherto the custodians of property at quarantine, were superseded, as respects new sites and questions of removal, by three "Commissioners of Quarantine." Under this law the Governor appointed George Hall, Egbert Benson and Obediah Bowne, Quarantine Commissioners.

In December, 1858, the Commissioners recommended the construction of an island at "Old Orchard" shoals in Raritan bay, on which to erect hospital buildings for quarantine purposes. This recommendation was not adopted. But early in the following year (1859), the new Commissioners, Horatio Seymour, John C. Green and George W. Patterson, purchased the steamship "Falcon," and located it below the Narrows as a hospital for fever patients. This temporary system was placed under the supervision of Dr. Elisha Harris. The steamers "Illinois" and "Empire City" were afterward obtained from the general government for quarantine purposes.

An artificial island having been constructed, Swinburne Island Hospital was opened in 1869, and the ship "Illinois" was used from that time as a boarding station in the lower bay.

The "laws and regulations of quarantine" during the years intervening between 1858 and 1869 were revised without material change, except in the additional powers conferred upon the Health Officer.

The opinions of sanitarians as to the measures necessary for an efficient quarantine differ widely. On the one hand, advocates are not wanting who believe that safety and protection depend upon time, as one of the factors necessary to the satisfactory solution of this problem. These consider the use of means through a period of fifteen to thirty days to be essential. On the other hand, there are those who favor the abolition of all obstacles to unrestricted commercial intercourse, whether of persons or merchandise.

The first-mentioned course is still adopted at the quarantines on our southern coasts, and in some recent instances, vessels from suspected ports in the United States have been subjected at European ports to a quarantine of forty days.

The causes of this difference of opinion may be interesting to scientific minds, and those who aim only at practical results, but their discussion is scarcely admissible in a report designed to present only the conditions upon which the prevention of disease depends.

It is important that the measures adopted by those to whom is intrusted the difficult problem of an efficient quarantine, and satisfactory sanitary regulations for the prevention of an epidemic of infectious or contagious disease should be consistent with the least possible burden to commercial interests. To this end, such should have not only clear but correct opinions of the measures necessary for the protection of the public health.

Quarantine is undeniably one of the most difficult of many vexatious questions that have engaged the attention of the sanitarians of our time. Epidemics of the same disease differ so widely in extent, so greatly in intensity — at one time circumscribed, at another continental — in the area of their development, in one, so mild as to bear but few of the distinctive characteristics of the disease, but again decimating communities and scourging nations by their terrible mortality, that it is not surprising that opinions have widely differed, both as to protective measures and remedial agents.

Again, climatic influences contribute in no inconsiderable degree to the differences alluded to; this is particularly the case in respect to yellow fever. It is scarcely to be supposed that the British islands which, with one or two exceptional instances, have never been visited by this scourge of lower latitudes, should entertain the apprehensions of danger, or views of prevention, of those countries which, lying within the fever zone, are liable to annual invasions by the disease. Nor is it unreasonable to suppose that those countries in which it is epidemic, and whose populations are so acclimated as to render the germs of the disease innocuous would be wholly indifferent to quarantine, and the hygienic conditions upon which its existence and propagation depends. The habitat of yellow fever is marked by well-defined geographical limits; the zone being embraced between 48° north and 35° south latitude. Quarantine as a protective measure against this disease is consequently not essential in all latitudes. This cannot be said of any other existing contagious or infectious disease.

A careful consideration of the differences of opinion referred to leaves upon the mind the gratifying reflection that scientific observation and experimental teachings point to the not distant, uniform adaptation of measures, according to circumstances, for the protection of communities from the causes of the disease, and the more effectual control, if not the elimination of those causes when developed. The most important of these are: 1st. The restrictions of an effective quarantine. 2d. The establishment of satisfactory

sanitary conditions in an exposed or infected locality. It would be an important error to adopt the one to the exclusion of the other measure. Those who believe in the *Cordon Sanitaire*, or the quarantine, as sufficient to limit and crush out disease, overlook the lessons of science and experience. On the other hand, the advocates of the spontaneous germ theory discover in efficient hygienic measures the *Ultima Thule* of success in the prevention of all epidemic and endemic disease.

Fortunately these theories in their practical results are in harmony. In fact, the employment of two different methods is essential to the success desired. The quarantinist obstructs the introduction of the disease-producing germ, and the hygienist removes the conditions upon which its propagation and dissemination depend, should it escape the restrictions of quarantine.

The principal diseases against which the "Laws and Regulations of Quarantine at the port of New York" are directed are yellow fever, small-pox, ship fever and cholera. As these diseases have each causes *sui generis*, different periods of incubation, and methods of propagation, the measures for protection, in the one case, would not, in all respects, be applicable in every other; or, if enforced with undeviating inflexibility, would be unnecessarily oppressive in many instances. An outline of the methods at present adopted with unqualified success at the port of New York, in the quarantine against yellow fever, cholera and small-pox, will serve to illustrate the most approved quarantine measures better than an elaborate theoretical treatise.

After the first day of May, and until the first of the ensuing November, all vessels from the West Indies, the Windward Isles, the east coast of South America, and the west coast of Africa, as also those from infected ports of the United States, are brought to an anchor near the quarantine ship, located in the lower bay and four miles inside Sandy Hook. The quarantine officer on duty immediately boards the vessel and ascertains: 1st. The present condition of the passengers and crew. 2d. The history of the vessel during the passage in reference to sickness, etc., and the sanitary history of the vessel while in the port of departure. The bill of health is then examined. The annexed form, proposed by the National Board of Health, is more satisfactory than the usual consular bills of health.

No. .... No. 1. *Island of Cuba.*
Form A of the *Port of Havana.*

NATIONAL BOARD OF HEALTH OF THE UNITED STATES.

BILL OF HEALTH.

I, the undersigned, Consul-General of the United States of America, at the Port of Havana, Island of Cuba, do hereby certify that the vessel, hereinafter named, clears from this port under the following circumstances:

Name.....	Nature (rig) .....
Tonnage	Guns.....
Apartments for passengers, No.....	Where last from.. .....
Destination	Name of Captain.....
Name of medical officer.....	Total number of crew.....
Total No. of passengers { 1st cabin..... 2d cabin..... steerage	Cargo .....

Sanitary history of vessel.....
1st. Sanitary condition of vessel.....
2d. Sanitary condition of cargo.....
3d. Sanitary condition of crew .....
4th. Sanitary condition of passengers.....
5th. *a* Sanitary condition of clothing, food, and water.....
b " " air space and ventilation.....
6th. Sanitary condition of port and adjacent country.....
a Prevailing diseases .....
b Number of cases of and deaths from yellow fever, plague, small-pox, and typhus fever during the week preceding.....

No. of cases of { Yellow fever..... Plague..... Small-pox..... Typhus fever	No. of deaths from { Yellow fever..... Plague ..... Small-pox ..... Typhus fever....

I certify that the foregoing statements are made by , M. D., one of the Sanitary and Quarantine Inspectors of the National Board of Health of the United States, who has personally inspected the said vessel; that I am satisfied that the said statements are correct; and I do further certify that the said vessel leaves this port bound for , in the United States, in free pratique for this port.*

In witness whereof, I have hereunto set my hand and seal of office at the
[L. S.] Port of Havana, the day of , A. D. 18 .

.....

Consul-General.

It will be seen that this form is calculated to supply information of much importance in determining the disposal of the vessel; and if intelligently and conscientiously rendered, will greatly aid quarantine officials at the port of destination in preventing the admission of contagious and infectious disease. It must be admitted, however, that even with this form, superior as it is in every respect, the information conveyed is often unreliable and unsatisfactory. The bill of health is often filled up and certified to by a consular agent, who is ignorant of the actual condition of the health of the port and shipping, and as is frequently the case, is interested in the trade of the port, and inclines to the solicitations of shippers and shipmasters for a "clean bill of health."

* By "free pratique for this port" is only meant that the vessel has not been quarantined here.

During the present season the ship Jorawar entered the port of New York, from Guadalupe and Trinidad, having the National Board's Bill of Health (Form A) and the certificate of the United States vice-consul at the latter place, that the "sanitary history of the vessel was believed to be good." Notwithstanding, the master freely admitted that while at Guadalupe (June 16 to August 8) sixteen men were sick of yellow fever, four of whom died; and while *en route* to Trinidad from Guadalupe eighteen men were sick of yellow fever, four of whom died.

During the past season, "clean bills of health" were furnished from several of the ports in the West Indies, long after authentic information from other sources had convinced the quarantine officers at the Port of New York of the prevalence there of yellow fever.

There is need of a disinterested and intelligent physician at every port, particularly those at which contagious or infectious diseases are endemic, who shall supply the statements in the bill of health; such statements to be certified to by the consul. This course is adopted at the Port of Havana. Bills of health from that port are filled by the resident representative of our National Board of Health, Dr. D. M. Burgess, and certified by the United States consul-general. This gives eminent satisfaction to the authorities at New York.

The sworn statement of the captain and medical officer of the vessel is next required; the form annexed being the one used at the New York quarantine:

QUARANTINE,..... 188 .

The undersigned, Captain and Surgeon, of the..... ..... from.....each being duly sworn, deposes and says: that the Port or Ports from which he sailed were, to the best of his knowledge and belief, perfectly healthy, being free from all malignant, contagious and infectious disease, that no such disease existed among the shipping in said Port or Ports at the time of his departure, and that no case of sickness or death from small-pox, cholera, yellow fever, ship fever, or any other contagious or infectious disease has occurred on board of his vessel, while in any port or on the passage.

.....

....

Sworn before me, this } day of.....,188 . }

....*Health Officer.*

A careful examination of the steerage is made in every instance, and if objectionable from filth, is ordered to be immediately cleansed and then fumigated with agents hereafter mentioned. If the vessel has been absent from the port of departure for a time equal to or exceeding the usual period of incubation of the disease prevailing at such port, the passengers are inspected by the quarantine officer, and the vessel is discharged under the following form or "permit," with the annexed extract from the "Quarantine Laws" on the reverse side of the permit:

PORT OF NEW YORK,

QUARANTINE,.....188 .

Arrived .. ..
Commander .....
Days' passage.....
From .....
Crew .....
Passengers..... .....
Cargo .....
This vessel has permission to proceed.

.....

Health Officer.

☞ This PERMIT to be exhibited at the OFFICE OF THE BOARD OF HEALTH within twenty-four hours (Sundays excepted) of your arrival, under the penalty of TWO HUNDRED DOLLARS.

13311. [See the other side.]

To the Captain, or person having charge of the vessel named in this permit :

Any person except the Master, Owner or Consignee, who shall go on board the vessel before this Permit shall be delivered, shall be guilty of a misdemeanor, punishable by a fine of FIVE HUNDRED DOLLARS, and imprisonment.

Any person, also, who shall neglect or refuse to comply with any provision of the law relative to Quarantine, or with any direction or regulation which the Health Officer may prescribe in the execution of the powers imposed and conferred upon him by law, shall be guilty of the like offense, and subject to the like punishment.

If there is sickness of a suspicious character, the sick are removed to the quarantine Hospital. If the ship is less than five days from a port infected with yellow fever, passengers and vessel are held until that period has fully elapsed. In the meantime the hatches are opened, the cargo and steerage are fumigated twice, at intervals of several hours, with chlorine or sulphurous acid gas.

All baggage, mails, and whatever articles liable to have become infected are put in a close apartment and submitted to disinfection by the agents mentioned. This done, the master of the vessel is given the annexed form of "permit," and directed to the discharging anchorage in the upper bay, distant three miles from the city :

Permits will be issued by the health officer on this blank.

PORT OF NEW YORK.

Quarantine 188 .

The from is permitted to proceed to quarantine anchorage, between Robin's Reef lighthouse and Bedloe's Island, and discharge cargo on lighters, subject to accompanying regulations.

When discharged, the captain is directed to report to the health officer on Staten Island.

....

Health Officer.

The pilot is directed to anchor this vessel out of the track of ferry boats and away from the ship channel. In case of failure or neglect to do this, the vessel will be required to move before she is permitted to discharge.

Here, under the constant supervision of the quarantine police, and the frequent visitation of the health officer, the most perfect system of cleanliness is enforced. Wind-sails, trimmed to the wind, are

steadily kept up in the hatchways. In the case of steamships, the bilge-water is pumped out twice or thrice each day, and clean water substituted. The wearing apparel and bed clothing of the sick are burned, or disinfected in a solution of sulphate of iron, one to one and a half pounds to the gallon of water, or of sulphate of zinc, two ounces to the same quantity of water. All the linen in use belonging to the vessel, as well as that of the officers and crew, is required to be thoroughly immersed in boiling water for a considerable time, then washed and dried before being taken to the city. Such clothing as cannot be thus treated is directed to be well shaken out and hung up in the steerage or some other proper place, and disinfected by burning an average of one and a half to two pounds of roll sulphur to every ten cubic feet, the apartment being kept closed for several hours. In the meantime the cargo is discharged upon open lighters, under the following "Rules and regulations," a copy of which is given to the master of every vessel:

QUARANTINE FOR THE PORT OF NEW YORK.

Rules and Regulations, established (pursuant to the provisions of chapter 358 *of the Laws of* 1863), *June* 1, 1880.

First. No lighter will be permitted to go alongside of or receive cargo from a vessel in quarantine, until the health officer has been furnished with the name and residence of each and every person engaged to work on board of each lighter to unload such vessel.

The health officer shall forward a copy of each list so furnished to the commissioners of quarantine as soon as practicable.

Each and every lighter will be allowed to deliver cargo at such place or places as may be specified in the permit.

Second. Stevedores, coopers, cleaners, mechanics, ship-keepers and others employed or working upon any vessel in quarantine, under the privileges accorded in these regulations, will be required to take their meals and sleep on board the vessels, or on a boat anchored in quarantine in the upper bay, and shall not, at any time after their employment shall commence on any vessel under quarantine, leave the waters embraced in the quarantine anchorage grounds for five days after the discharge of the cargo from the vessel is completed, unless sooner allowed to do so under a written permission of the commissioners of quarantine or health officer.

Third. No person, except the officers and employees of the quarantine department; those regularly licensed for service under quarantine, and such as are necessarily engaged in business or detained by sickness therein, shall visit any portion of the quarantine establishment, or go on board of any vessel employed by any of the quarantine authorities, without the permission of the commissioners of quarantine or health officer.

Fourth. No person except the quarantine officers and employees, stevedores, coopers, cleaners, mechanics having work to do on board, or ship-keepers employed by owners, will be permitted to go on board

of a vessel under quarantine. Any person who shall go on board of such vessel from a lighter alongside of such vessel or otherwise, will be detained for a period of five days in quarantine; the license of any lighterman from whose lighter such person shall go on board of such vessel shall be revoked.

Any lighter upon which any stevedore, cooper, cleaner or other person shall go on board or take passage from any vessel in quarantine, without the permission of the commissioners of quarantine or health officer, will be deprived of its license thereafter, and the owner of such lighter will be held liable and responsible for any damages or sickness resulting therefrom.

Fifth. The owner or owners of any lighter employed at quarantine will be held responsible for the manner in which the persons employed by such owner or owners abide by and conform to these regulations, and such regulations as may be hereafter made or established, and shall also place in quarantine hospital such of the persons employed by them as may become sick while engaged in the lighterage of cargo from any vessel in quarantine. This regulation applies to all persons holding a license to do work about vessels under quarantine, and such persons shall be held responsible for the men sent by them into quarantine.

Sixth. Vessels anchored in quarantine, which are permitted to proceed and require a towboat, will make signal for the same by a flag suspended from the bowsprit. Tugs will be permitted to tow vessels displaying such signals, but no person will be allowed to go on board until they are cleared from quarantine.

The exposure of the cargo to air in its transit to the dock serves still further to remove the danger of infection. There is no instance of the propagation of disease from that source in the history of quarantine at the port of New York. The cargo removed, the hold is now thoroughly washed, and in the case of sailing vessels the "limber-streaks" along the kelson taken up, accumulations of filth removed, and the air spaces washed down, until the water returns clear of any evidence of impurity.

A solution of sulphate of iron, of the strength above indicated, is now used, with which to scrub and rinse the entire hold, inclusive of the "air spaces" and "lumber streaks." Finally, from fifty to one hundred pounds of sulphur, according to the size of the vessel, are burned under the hatches, which are closely covered.

The ship's crew is now mustered, and examined as they pass before the health officer. If all are well the vessel is allowed to proceed to her dock without further delay. It is proper to remark that in vessels suspected of yellow fever infection the crew is not allowed to discharge cargo, or if they do, are submitted to a quarantine of observation for five or six days.

It is difficult to discover how the disinfection could be more thorough, or the sanitary condition more satisfactory by a longer delay than sufficient to accomplish the results mentioned.

All foreign vessels not subject to visitation in the lower bay are boarded by the health officer or his deputy at the boarding station on the Staten Island shore, a short distance above the Narrows, and opposite the health officer's residence. From May until November following, all vessels from ports "south of Cape Henlopen" are visited at this point, unless some of the ports, south of this, become infected with yellow fever; in which case vessels from such ports are examined at the quarantine station in the lower bay.

Although the yellow fever germ has escaped detection under the most skillful and patient scrutiny, the development of the disease, where it is endemic, is known to be associated with the decomposition of animal and vegetable matter of the more subtle forms, in connection with filth, stagnant conditions of water, and atmospheric influences under a prolonged high thermometrical range.

As these, and all unsanitary conditions contribute to the propagation and virulence of the whole list of infectious and contagious diseases, and as the system adopted for the limitation and control of one is to a great extent applicable to all others, with a few marked differences which will be noticed, it is unnecessary to enter into a detailed description in each of the quarantinable diseases, either of methods of quarantine or hygienic measures. The notable differences referred to are the period of incubation, and the mode of propagation. Essential changes in the management of quarantine of small-pox is required from the character of the disease-producing germ, and the comparatively long period of incubation.

Small-pox. The vast emigration now flooding the country from European ports, and the rapid transit across the Atlantic, often several days short of the incubative period, afford many opportunities for the transmission of latent germs of the disease to interior communities, however vigilant quarantine authorities may be. In most instances where a case is discovered on a steamship, it is in the first stage of development. The vaccination of passengers and crew, and thorough cleansing and disinfection of such articles and portions of the vessel as the patient has been in contact with, are sufficient protection, and the vessel may be given *pratique*.

But if the infectious stage of the disease has been established, without proper isolation of the case from the beginning, there is no assurance of safety but to detain all exposed persons for observation, until the result of vaccination is secured. And if on the third or fourth day satisfactory results from vaccination are not obtained, unless it be evident that previous protection is the cause of failure, revaccination is indispensable.

The danger that the germs of the disease may pass the most efficient quarantine, and develop in our populous seaport cities, along the rapid internal currents of commercial intercourse, or at the great foci of immigration, is so considerable as to necessitate the utmost vigilance of the health authorities at these points. So considerable did this danger appear to quarantine officers at the port of New

York during the extraordinary immigration of the early part of the present year, that correspondence was opened with the health officers at Buffalo, Chicago, St. Louis, Montreal and other places, urging unusual vigilance in the examination of emigrants passing those points.

The most stringent quarantine — the most effectual *cordon sanitaire* ever established — the utmost vigilance of local authorities, cannot compensate for neglect of the one great protective measure, vaccination. Traduced by its enemies, too often neglected by its friends, it has nevertheless, since the days of Jenner, steadily advanced in the estimation of scientists, humanitarians and the people at large. One fact may here be stated, which illustrates better than a thousand theories the success of this measure in eradicating small-pox from civilized communities. Under the intelligent supervision of the board of health of New York city, and the indefatigable efforts of its vaccine physician, Dr. Taylor, no case of this disease originated in the city from January, 1878, until the fall of the succeeding year, embracing a period of nearly two years.

Cholera.—For the past twelve years this erratic and frequently nomadic disease has not visited our shores. If, like "ship fever," the conditions upon which its propagation depends were of the past, and not likely again to occur, there would be no occasion for reference to it in this place. But such is not the case.

Cholera may prevail as an epidemic or as an endemic, and in either case is usually a disease attended by great mortality.

As an epidemic, it first prevailed in this country in 1832; again in 1848–49, in 1853–54, and in 1866 and 1868.

In portions of India, its birth-place, it prevails as an endemic. At irregular periods the disease has spread in every direction, invading all portions of the globe. Neither winter's cold or summer's heat seem to have materially influenced its progress. Oceans and continents alike are traversed; all climates and seasons fail to impede its movement, although a certain amount of heat in every latitude in which it has prevailed seems to have increased its severity.

The *causes* of cholera, like those of yellow fever, are obscure. That it depends upon a poison diffused in the atmosphere, whose intensity is increased by predisposing causes, such as defective drainage in miasmatic localities, impure air and inefficient sewerage, there is no reasonable doubt.

The period of incubation is generally brief. Two or three days is the average limit of development after exposure to the cause.

The mode of transmission is unquestionably through human intercourse; its chosen path in most cases being along the great highways of travel and commerce, and its approach often seems to have been checked by thinly settled frontiers or desert space; its transmission in other instances has appeared to be facilitated by atmospheric currents over considerable distances.

Whether the instance in which the disease has seemed to origi-

nate independently of human intercouse, as in the epidemic of 1849–50, when it appeared in several vessels that had been ten or twelve days at sea and had sailed from ports that had no suspicion of cholera, are evidences of propagation through air currents bearing the germ-producing disease, or, that the disease was developed from a latent infective source introduced from a locality in which the disease prevailed, is a question upon which experienced observers might differ.

The respiratory organs and the mucous surface of the digestive track are probably the avenues of approach for the poison; whether organic or inorganic in character, has not been determined; there is much room for difference of opinion as also for investigation in this matter.

That cholera is contagious, in the sense of being communicated by personal contact or by a poison eliminated from the surface of the body or the air passages, is not proved.

Dr. Goodeve, of the Bengal army, whose long residence in the familiar haunts of cholera entitles his opinions to great weight, says. "Cholera does not spread from the sick to the whole from any rapidly acting emanation."

Drs. Mackintosh, Aitken and Gardner bear testimony to the fact that "infection does not seem to have arisen from the dead body, if one may judge from the impunity with which an immense number of post-mortem examinations were made in most places, and the contents of the intestines submitted to all kinds of examination."

Dr. William Budd regards cholera as contagious, "but in a very different form and manner than if it were so by means of a volatile or gaseous emanation proceeding from the sick." "Contagion from cholera discharges may operate, but there must be something beyond this," etc. Might it not be more in accordance with facts to suppose that neither a miasm from without, nor a miasm from within, exclusively contains the specific poison? May it not be that two factors are needed, the one some air-borne material or some catalytic modification of atmospheric elements coming from without?

It is generally believed that the disease is communicated through choleraic discharges of the patient. It is not improbable that the germs which exist in the discharges are innocuous when passed, but find in the atmosphere catalytic agents necessary to their activity.

The germs thus vitalized contaminating water, or dessicated and borne upon the air and inhaled, may be vivified by being brought into contact with the human organism, and thus reproduce the disease.

Whatever the cause or condition upon which the propagation of the disease depends, a foul atmosphere, reeking with emanations from cess-pools and privies, is conclusively proved by the history of numerous epidemics, to greatly facilitate the extension and increase the ratio of mortality attending the disease.

Prevention is far more difficult than in some other contagious or infectious disease. If the choleraic discharges become the foci of the disease, the victims are so many centers of development. The

soiled clothing of patients is unquestionably a frequent vehicle for the transmission of the infection.

Opportunities for propagation thus multiplied, supplies facilities for the marvelously rapid extension which has characterized every invasion of epidemic cholera.

Experience has shown that an efficient quarantine of great commercial ports, an effective *cordon sanitaire* across districts of country in the course of its march, have contributed materially to arrest its progress.

The invasion of a locality established, it not only becomes necessary to take measures to prevent its extension through a rigid system of external and internal quarantine, as the circumstances may require, but by the most zealous and untiring efforts to secure satisfactory sanitary and hygienic conditions.

The methods adopted to disinfect and purify localities infected by the poison productive of yellow fever are eminently applicable in the disease under consideration.

There is little doubt that the morbific agent of the disease is principally in the alvine discharges; and not only during the active stages, but in the usual preliminary diarrhœa. The practical lesson to be learned from this is the imperative necessity for an efficient quarantine of the sick, and such as have been exposed to the infective principle.

The rules of quarantine may often be administered with flexibility, and yet with entire safety to the community they are designed to guard. This is well illustrated by the management of the cases under consideration.

A vessel arriving with disease on board should be treated according to circumstances. The sick being removed, the infection of other persons, or of the ship, must be considered. If judicious isolation of the sick and measures for disinfection have been adopted for a time equal to or exceeding the extreme period of incubation, which in cholera is from eight to ten days, the vessel may be allowed to proceed. On the other hand, if the sickness or death has occurred within the incubative period, without proper isolation of the case, the passengers should be removed and kept under observation for a time sufficient for the development of any infective principle which may have been transmitted. The vessel may be discharged after being thoroughly cleansed, and all soiled linen, clothing, or whatsoever has been in contact with the sick, scrupulously cleaned or destroyed.

Prolonged immersion in boiling water, preceded or followed by saturation in a solution of sulphate of zinc, two ounces to the gallon of water, will effectually secure this result.

It will be a wise precaution to insure the destruction of all ejections and dejections as they fall from persons suffering from cholera or yellow fever. For this purpose, it is only necessary that a solution of sulphate of iron or zinc, of the strength before mentioned, should be always at hand in the vessel to be used. For obvious

reasons, the dejections of such patients should never be passed or thrown into a common privy until subjected to disinfection by this means; and the chamber vessels used should be frequently washed in a solution of sulphate or chloride of zinc, or of sulphate of iron.

It is impossible to establish formulas for quarantine which shall be applicable to all cases in every locality. There should be a certain degree of flexibility to many of its "rules and regulations." That which is absolutely necessary for the port of New York would, perhaps, be unnecessary, and consequently would be ignored in an English port. A necessity which is based upon enlightened experience or scientific deductions, in one place, would be rejected in another. These are difficulties which beset the intelligent quarantinist, and will retard, but cannot arrest, the progress of either sanitary science, or an improved system of "quarantine regulations."

It is not too much to hope that at no distant day a great necessity, an international code of quarantine laws and regulations, may be supplied, based upon an intelligent comprehension of the widely different needs of localities arising from geographical or topographical differences and varying susceptibilities to morbid receptivity.

Internal Quarantine.

The principles which govern in the sanitary procedures and isolation of the sick at the maritime quarantine at the port of New York, in no material sense differ from those which must be applied in arresting the progress and development of contagious and infectious diseases, which prevail in cities, villages and towns, and which is technically *internal quarantine.*

The principles referred to essentially require that the sick affected with contagious or infective poison shall be isolated from all persons liable to receive the disease. To this end the sick person should be confined to one apartment, with such restrictions upon approach as will prevent the intentional or inadvertent admission of unprotected or unexposed persons. Other inmates of the same house should not occupy an apartment adjacent to the sick, if the rooms communicate by doors or windows, which for any purpose are occasionally opened. Proper ventilation is an important consideration in the modification and elimination of this class of diseases. The virulence of the poison, which is thrown off in contagious affections, is increased by its concentration in close and ill-ventilated rooms. Good ventilation is not only necessary to dilute the disease producing poison, in case of its further propagation, but to invigorate and sustain the system under the depressing influence of disease. It will be well to change the patient every day if practicable, to a clean, well-aired apartment adjacent to the sick chamber. Every object with which the sick or their attendants are brought in contact, whether wearing apparel, bed clothing or utensils, should be isolated until washed and immersed for a time in boiling water.

Communication between the attendants of the sick and the well must be prohibited until measures have been taken to disinfect the

clothing worn by them while in attendance, or until it is changed for such as has not been in contact with the sick or the atmosphere of the apartment. It should not be forgotten that in some of the contagious diseases, the air of the sick room is impregnated with the disease-producing germ, and will communicate the contagion as quickly and certainly as contact with the sick. For this reason, while ventilation is desirable and necessary, it should never be obtained by opening windows upon frequented alleys, or adjacent to occupied apartments, or even when in close proximity to houses that may by any possibility be infected by the atmosphere of the sick room. In diphtheria and scarlet fever it is better that adults only should attend upon the sick.

When the convalescence of the sick is fully established the room must be thoroughly cleansed and disinfected by the use of the disinfectants mentioned in speaking of maritime quarantine. Finally, the rooms should be aired for a considerable time before they are again occupied. In convalescence from diphtheria it will be a wise precaution to prohibit communication with the well, for two weeks after the patient has recovered. Instances are frequent which seem to prove that a convalescent from this disease may communicate it for a longer period than in most diseases of a contagious or infectious character. In cases of children who attend shcool, before readmission, a "permit" should in every instance be required from the Health Officer of the local Board, based upon the personal observation of that officer, or the written declaration of an intelligent medical attendant.

A remarkable feature of diphtheria and scarlet fever is their tendency to develop with great virulence, not only among the crowded and filthy tenement houses of our cities, but in those of our rural population. Sunny hamlets in the valleys and storm-swept homes on the hills and mountain sides are not exempt. Every neighborhood in which the dreaded scourge makes its appearance, and every household in such locality should adopt the most efficient sanitary measures in connection with as complete isolation of the sick as is consistent with their proper care. It is the uniform testimony of medical observers, that the fatality of these diseases, as with all others caused by contagious and infectious poison, is greatly increased by unsanitary conditions, whether these are found in cities or isolated homes. The unsanitary conditions being equal, the mortality is much greater in thickly populated districts, as shown by the vital statistics of New York and other cities. In the tenement house known on the records of the Health Department of New York city as "No. 441," eight deaths occurred, seven being from diphtheria, between the 1st day of February, 1880, and September 20th of the same year. The Sanitary Inspector's report on these premises, made during the month last mentioned, is as follows:

"The cellar is wet, dirty and covered with rubbish, and during high tide is flooded with sewerage matter from the main sewer, which is discharged into the cellar through the defective house sewer

connection. The waste-pipes through the house are defective and are not trapped, and permit a constant influx of sewer gas into the house. The waste-pipe is not properly ventilated (having one-inch gas-pipe to the roof), the privy vault is used in common by three tenement houses, is unventilated, is nearly full of solid matter, and is very offensive. The yard is not flagged. Very offensive odors pervade the house from these causes." A formidable indictment indeed! And good reason for the order to "vacate the premises," which was immediately issued by the board of health.

Again: On one of the highest hills of an interior county of the State lives a farmer of small means, in a single storied house, without attic; one room answers the purpose of sitting-room, dining-room and kitchen, which, with two bed-rooms and a seven by nine pantry, accommodate husband, wife and six children. The cellar of the house is low and covers half the area of the house. In it, during the winter season, was stored a supply of vegetables for the family, and during the early spring and summer past, retained the accumulated filth from decayed and decaying vegetables. The "slops" from the house were disposed of from the open door or window, at front or rear of the house, as convenience prompted. A retentive subsoil of clay nearly as effectually prevented the drainage of these "slops," as if they had been deposited in a well-caulked tank, and, mixing with the light mold of the surface soil, composed a slough which the pigs from an adjacent barnyard often enjoyed. And the privy, like thousands even among more prosperous farmers, had been used until its under-drained, unwalled vault was nearly full, in the morning or evening air disgusting the passer-by on the highway. Is it surprising that in the early summer past, when the atmosphere of this home should have been redolent with the perfume of flowers, instead of the noxious gases from cess-pools and privies, that diphtheria should enter there? Of the six children that gathered around this family altar, for such there were even amid so much stolid ignorance of natural and sanitary laws, five were stricken down, three were buried in as many weeks, and two after an illness "nigh unto death" recovered. It would, perhaps, be difficult to convince these Christian parents that their own neglect had contributed to these sad results. It is easier and more consoling for such to believe that it is a just, though mysterious, dispensation of Providence; or, for another class of minds, to believe that they are the puppets of some blind and mysterious Fate, rather than the victims of that ignorance which has led to the violation of beneficent laws instituted by the Creator, and proclaimed in the economy of all his works, if they would but study to understand them.

These pictures are not overdrawn, nor are they facts of unfrequent occurrence. All these unhealthy conditions do not, of course, exist in every instance. But in thousands of the rural homes, as well as cities of the Empire State, such unsanitary conditions exist as tend to foster the germs of contagious and infective disease, and increase their mortality. A judicious study of sanitary rules, regulations and laws on the part of the people, and a cheerful coöperation with the

authorities to whom is delegated the duty of enforcing them, will speedily mitigate the severity and diminish the mortality arising from this class of diseases.

But to return to the consideration of measures for securing such sanitary results as will eradicate the germs of the disease where they exist, or prevent their establishment where they do not exist.

A thoroughly drained soil beneath and around an occupied house, either in city or country, is important. Proper house drains in the country are the exception, there being no communication in most cases with a main or other safe receptacle; commonly they are lost in the soil, a few feet, more or less, from the house. These conditions should be remedied and efficient drainage secured. In the absence of this, the sewer or drain should be frequently treated with a liberal supply of a disinfecting solution made of sulphate of iron, not less than one pound to the gallon of water.

Water-closets and privies are also in a large majority of instances faulty in construction and abominable in management. These should be disinfected with one of the agents mentioned so frequently that foul odors will always be prevented, for these are danger signals more useful than agreeable. These duties are not onerous, if undertaken with system and intelligence. Unfortunately the time has not come when their discharge can be left to those even most interested — the people. The voice of authority needs to be and has been invoked to aid in the work. It has clothed certain representatives of the people in the cities, villages and towns of the State with power to secure the cleansing and disinfection of all persons, places and things suspected of, or contaminated by, contagious or infective disease. Chapter 324, Laws of 1850, provides:

Section 1. "It shall be the duty of the common council of every city, and the trustees of every incorporated village in this State, in which there is not now a Board of Health duly organized, to appoint once in each year a Board of Health for such city or village, to consist of not less than three nor more than seven persons, and a competent physician to be the health officer thereof."

§ 2. "The supervisors and justices of the peace, or the major part of them, of each town in this State, shall be a Board of Health for such town for each year, whenever, in the opinion of a majority of such board, the public good requires it; and they shall appoint some competent physician to be the health officer for such town."

These boards of health thus established have power under the same act, among other things, "to regulate and prohibit or prevent all communication or intercourse with all houses, tenements and places, and the persons occupying the same, in which there shall be any person who shall have been exposed to any infectious or contagious disease."

The State Board of Health has recommended to such local boards as may be organized under the statute, the adoption of the following "Sanitary Ordinances," as being necessary to secure prompt and

efficient action, in the purification and "stamping out" of the *contagium* of spreading disease:

§ 7. Any householder in whose dwelling there shall occur a case of cholera, yellow fever, typhus or typhoid fever, scarlet fever, diphtheria or small-pox, shall immediately notify the Board of Health of the same; and until instructions are received from the said Board, shall not permit any clothing or other property that may have been exposed to infection to be removed from the house. Nor shall any occupant change his residence elsewhere without the consent of the said Board during the prevalence of any public danger from said disease; and all physicians and other attendants upon any person sick with small-pox, cholera, typhus, typhoid or scarlet fever, diphtheria, or other disease dangerous to the public health, shall forthwith report the same to the Board of Health. And it shall be the duty of such physicians and attendants to avoid exposure to the public of any garments or clothing about their own persons that may have been infected from exposure to any diseases.

§ 8. No person or article liable to propagate a dangerous disease shall be brought within the limits of this city (or village) without the special permit and direction of the Board of Health thereof; and whenever it shall come to the knowledge of any person that such person or article has been brought within such limits, he shall immediately give notice thereof to the said Board, together with the location thereof. No person shall, within the built-up portion of a city or village, without a permit from the Board of Health thereof, carry or remove from one building to any other, or from any vessel to the shore, any person sick of any contagious disease. Nor shall any person, by any exposure of any individual sick of any contagious disease, or of the body of such person, or by any negligent act connected therewith, or in respect of the care or custody thereof, or by a needless exposure of himself, cause or contribute to or promote the spread of disease from any such person, or from any dead body. And it shall be the duty of this Board to order such separation and isolation or domestic quarantine of the sick from other persons not necessary as attendants, and also such special care and disinfection as shall be needed in order to prevent the spreading of such disease to others.

§ 9. There shall not be a public or church funeral of any person who has died of small-pox, diphtheria, scarlet fever, yellow fever or Asiatic cholera; and the family of the deceased is required to limit the attendance to as few as possible, and to prevent the presence, so far as they are able, of those who have not had the disease of which the deceased person died; and it shall be the duty of householders and all persons concerned, where a death occurs from any contagious or pestilential disease, to prevent needless assembling in the apartments and house, where such diseases are, of all persons liable to become infected thereby.

While the above "ordinances" are not in the form of a statutory law, their force and effect will be equally operative when adopted and published by Boards of Health in towns and villages.

One of the best legal minds in the State, and familiar with the State laws relating to public health, declares: "It is a doctrine in force in our State, sanctioned by repeated decisions from 1828 down to the present time, that a town or corporation is not restricted from making *further regulations* upon a subject regulated by a general law."

There is one other statute bearing upon "Internal Quarantine;" one long neglected and almost forgotten, to which reference is here made.

CHAPTER 438, LAWS OF 1860.

AN ACT to encourage and provide for a general Vaccination in this State.

PASSED April 16, 1860.

SECTION 1. The trustees of the several common school districts in this State and the proper local boards of common school government in the several cities of the State are hereby directed and empowered, under the provisions hereinafter set forth, to exclude from the benefits of the common schools therein any child or any person who has not been vaccinated and until such time when said child or person shall become vaccinated.

§ 2. The said trustees or local board may adopt a resolution to carry into effect the power conferred by the first section hereof; and whenever they shall do so they shall thereupon give at least ten days' notice thereof, by posting the same in two or more public or conspicuous places within the limits of their school government, and shall, in said notice, advertise due provision for the vaccination of any child or person of suitable age, who may desire to attend the common school, and whose parents and guardians are unable to procure vaccination for them, or for the children of suitable age of such parents as by reason of poverty may be exempted from taxation in such school districts.

§ 3. The said trustees or board may, in their or its discretion, appoint some competent physician and fix the compensation for his services, the duty of which physician shall be to ascertain the number of children or persons in the school district or subdivision of city school government, being of an age suitable to attend the common school, who have not been already vaccinated, and, also, to furnish to the said trustees or said board a list of the names of all such children or persons. It shall also be the duty of said physician to provide himself with good and reliable vaccine virus wherewith to vaccinate such of the number of children or persons aforesaid as have not been vaccinated according as the trustees or board shall direct, and to thereupon give certificates of vaccination when required, which certificates shall be evidence thereof for the purposes of a compliance with section first hereof.

§ 4. The necessary expenses incurred by the provisions of this act shall be included and collected in the annual tax bill of the district, town, village or city as may be proper according to law.

§ 5. The trustees of the several school districts of this State are hereby required to include in their annual report the number in their several districts between the ages of five and twenty-one years who are vaccinated and the number unvaccinated.

When it is considered that small-pox may be banished from the face of civilization by attention to this one duty, vaccination, neither difficult or expensive to secure, and when it is known that thousands of lives, precious beyond measure to their friends, and representing millions of money-value to the country, are annually the victims of this disease, the neglect, prejudice, or whatever cause that stands in the way of securing immunity from it, is equally unpardonable and incomprehensible. Again, however important that the laws in relation to internal quarantine should be executed, which, in connection with the "sanitary ordinances," embrace hygienic and sanitary measures; however full and explicit the authority they give, their execution should be supervised and regulated by a competent Health Officer, employed by and accountable to the local authorities.

The "Act to establish a State Board of Health," makes it "the duty of the said Board to obtain, collect and preserve such information relating to deaths, diseases and health as may be useful in the discharge of its duties, and contribute to the promotion of the health, or the security of life in the State of New York." And it is made "the duty of all health officers and boards of health in the State, to communicate to said State Board of Health, copies of all their reports and publications; also such sanitary information as may be useful."

To comply with the law, and enable the State Board to fulfill the mission for which it was created, requires the local boards to make a faithful report to the State Board of Health of all the outbreaks of contagious or infectious diseases in the locality where they occur. It is the duty of such representatives of the local boards as may be designated for the purpose, to maintain a vigilant supervision of school-houses and their surroundings, of assembly rooms, and public houses, that the sources of disease, and those conditions which encourage the propagation of contagious and infective distempers, may find no abiding place.

The diseases recognized by the health authorities of the State as contagious or infectious, and which require sanitary supervision to prevent their introduction, or mitigate their severity and limit their propagation where they prevail, we here enumerate:

Malignant cholera,	Puerperal fever,
Yellow fever,	Cerebro-Spinal fever,
Typhus fever,	Small-pox,
Typhoid fever,	Diphtheria,
Relapsing fever,	Dysentery,
Scarlet fever,	Measles.

If the Health Officers appointed by the local boards act with becoming zeal in promulgating proper instructions and supervising the

execution of sanitary regulations, a great work in the limitation and suppression of these diseases will be speedily effected.

It is earnestly enjoined upon those to whom the law has delegated the authority to act as boards of health in the towns and villages, to organize as such, and through the appointment of active and efficient Health Officers, contribute to the preservation of human life and security of the public health.

The powers conferred by statute, or which may be secured by the adoption of the "Sanitary Ordinances" recommended by the State Board of Health, if not ample for the needs of our great cities, are quite sufficient for towns and villages, if employed with intelligent zeal. "Every hotel, lodging-house, tenement-house, work-shop or other building where several persons are employed, factory, school, church, theater, and every public building, shall be open to the inspection of the health officer and of the officers of the board of health." Thus affording to the local authorities every opportunity necessary. And authority is given "to abate *any* nuisance within such village, injurious to the public health." The work that the State Board of Health aims to accomplish, through the co-operation of the local boards, is in no sense theoretical; on the other hand, it is eminently practical, and deals with considerations of the greatest importance to human life, the public health and prosperity of the country.

In conclusion it is again urged that to secure the desired results the people must be taught sanitary rules, in general at least. The press, the pulpit, and that profession of all others, which is the attendant of suffering humanity from the cradle to old age, have great influence (and proportionate responsibility) in accomplishing this. In this work the State Board of Health should, and no doubt will, lead the way, prompting, directing and advising local sanitary officers, and where proper and necessary, aiding them to enforce such regulations as may be necessary for the public health and the discharge of their duty to the people of the State. A great public interest is perceptible; manifested in the discussion of sanitary reforms — the formation of active sanitary organizations, such as the American Public Health Association, and the demand for the creation of inter-State regulations and State Boards of Health.

England has already legislated in that direction; an inspection of provisions in markets, and official analyses of suspected samples are provided for, with power to punish offenders by fine and imprisonment. State laws are proposed, and in at least one instance (Wisconsin), adopted, creating local inspectors and a public analyst.

Notwithstanding the constitutional dislike of the American people toward governmental interference in local matters affecting their right to "do as they please with what is their own," State legislation has been invoked for municipal communities with marked success, and evidence of increasing popular favor. The wealth, culture, social standing and moral influence of the great cities of our State are organizing with generous self-sacrifice for the relief and improvement

of the people; and they are hopefully responding to the efforts in their behalf. Property-owners are beginning to realize that the restrictions of law in the suppression of nuisances, and the construction of tenement houses, are not inconsistent with their interests. The ignorant, ill-fed, over-crowded populations, too helpless, or grown indifferent from long endurance, to effect any change themselves, begin to understand the importance of improved sanitary conditions. Much remains to be done which can only be effected by careful consideration of differences of opinion, and a wise forbearance in their discussion. Individuals may do much; municipal organizations can do more; State Boards of Health and Legislatures can render efficient aid; but the people must be taught the necessity of cheerful obedience. They should at the same time be made to feel that whatever power Legislatures may give—whatever assistance State or municipal boards may render, the real work is theirs, so far as encouragement and co-operation are concerned, and theirs is the responsibility as well as the benefit. In the intelligence and zeal of the people in promoting sanitary reforms will be found a more potent aid than that of Aaron and Hur, to stay the hands of authority while the influence of quarantine restrictions and hygienic measures smite the forces of disease.

The letter of an eminent physician in an adjoining State to the superintendent of a division of an important line of railroad, calling his attention to certain unsanitary conditions which are now known as the causes of typhoid fever, elicited the following reply:

"The remedies you suggest are those that for several years we have tried hard to enforce." * * * "I wish I could do more to remedy this matter than I am doing; *and I wish that the citizens of every town that our road runs through would make such an outcry that no employee at a station would dare have these places in any other condition than that of perfect cleanliness.*"

Instruction of the people through the frequent publication and distribution of "Sanitary Laws," and ordinances, is one of the great necessities of the work in hand. They must be taught to look for the causes of disease in their local surroundings, rather than the dispensations of a mysterious Providence.

"There was a time," says one of the most self-sacrificing sanitarians of our State, in a recent paper, "when fasting and prayer to avert disease on the one hand, and a faithless distrust of common sense on the other hand, were obstacles to the sanitary improvement of the masses, and to the protection of public health. When Lord Palmerston was waited on by a delegation of Scotch petitioners for the royal appointment of a fast day, he surprised them by saying: "Go home and see that your towns and cities are freed from those causes and sources of contagion which, if allowed to remain, will breed pestilence and be fruitful in death, in spite of all prayers of a united but inactive people."

WILLIAM M. SMITH, M. D.,
Chairman of Committee on Quarantine.

REPORT OF STANDING COMMITTEE ON PUBLIC INSTITUTIONS.

The Committee on Public Institutions would respectfully report:

That they find the topic one of such magnitude that they will content themselves with but one aspect of the subject, and leave the discussion of the various theories with reference to the causes of ill health arising from deficiency of pure air, to specialists who have elaborated this subject in suitable treatises. In public buildings of various kinds, requiring different methods for furnishing the requisite air supply, it must be demanded that in future these requirements shall be carefully examined and reported upon before the edifices are completed. Your committee prefer the exposition of successful experiment to any theoretical opinions. We, therefore, present the results attained in one of our largest and most useful public buildings.

New York State Lunatic Asylum at Utica.—Accompanied by Mr. Joseph Graham, the engineer of the State Asylum for the Insane, we made several inspections of that institution. It is furnished with the most perfect system of ventilation, heating, drainage and water supply of any public building we have ever visited. The asylum, which is located at Utica, is on an elevation of about one hundred feet above the Mohawk river, and about a mile from the New York Central and Hudson River railroad depot, in the western part of the city, on a farm of one hundred and fifty acres. The building is so located as to give a lawn of about twenty-five acres of pleasure grounds around the front and sides of the buildings.

Ventilation and Heating.—The method of heating and ventilating the institution is considered by the managers to be the most economical, as well as the safest and best, and, on account of its superiority, information has been frequently asked respecting it. A short time ago, an application was made through the United States Department of State by the British government for full particulars concerning the appliances and method, and the whole matter in detail was referred to the superintendent of the institution, Dr. John P. Gray, who made a very extensive report which was submitted to the board of managers before transmission to Washington. It is prepared with such great accuracy, and the method so clearly defined that we here give an abstract of it.

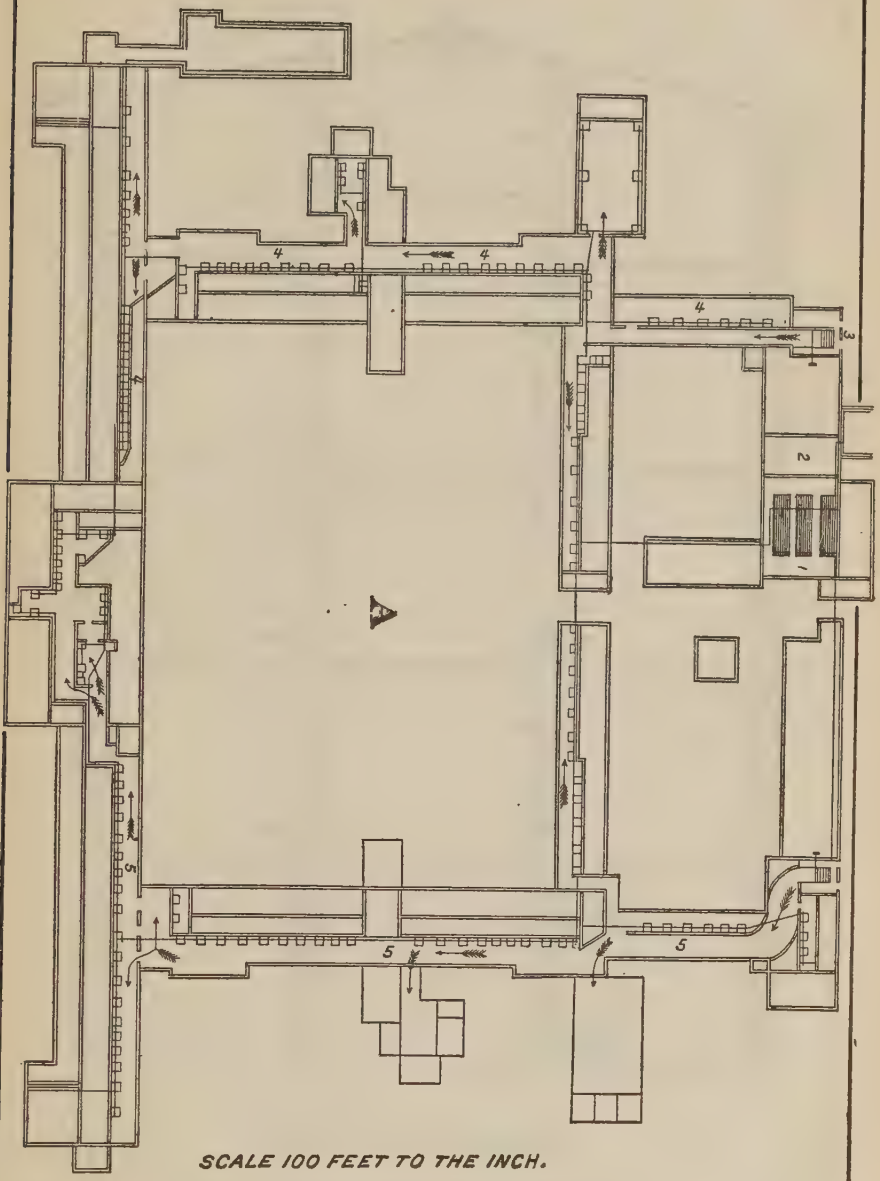
The system of ventilation adopted is by means of forcing air into the building by the use of two centrifugal fans. A drawing and description of the same will be seen, together with a plan of the basement, a sectional elevation showing ingress and egress air flues,

and ridge ventilation, and an enlarged view of block radiators. The air is sent by the fans to all parts of the building. It is delivered first into the large channel, or basement air duct, or air *plenum*, which, as shown by Drawing A, is continued under the entire building. Let 1 represent the boilers; 2, the engine; 3, the fans; 4, the radiators and steam pipes, and 5 the air duct or *plenum*, and let the arrows show the direction of air currents. Second, the air passes by flues from this air duct or air *plenum* into the various wards and rooms to be supplied. Each flue is independent and has an exit at but one point, and opens into wards or rooms to be supplied at a point above the level of the top of the windows and doors. While this is unquestionably the best plan, it is not absolutely necessary to success in ventilation. But in a building kept for the insane, it is advisable to have the air enter above a point where patients would be likely to throw articles into the flues. Another object in having the flues at this point is that the opening and closing of doors or windows will not interfere with the current of incoming air, and by this method the air is distributed uniformly through every part of the building. Flues are constructed from the corridors and rooms commencing just above the base-board, each flue passing into the attic air chamber independently. Over part of the building is ridge-ventilation arranged as shown in Drawing B. Over other parts of the building the exit is through ventilators fixed at regular distances, which are shown by sectional Drawing C.

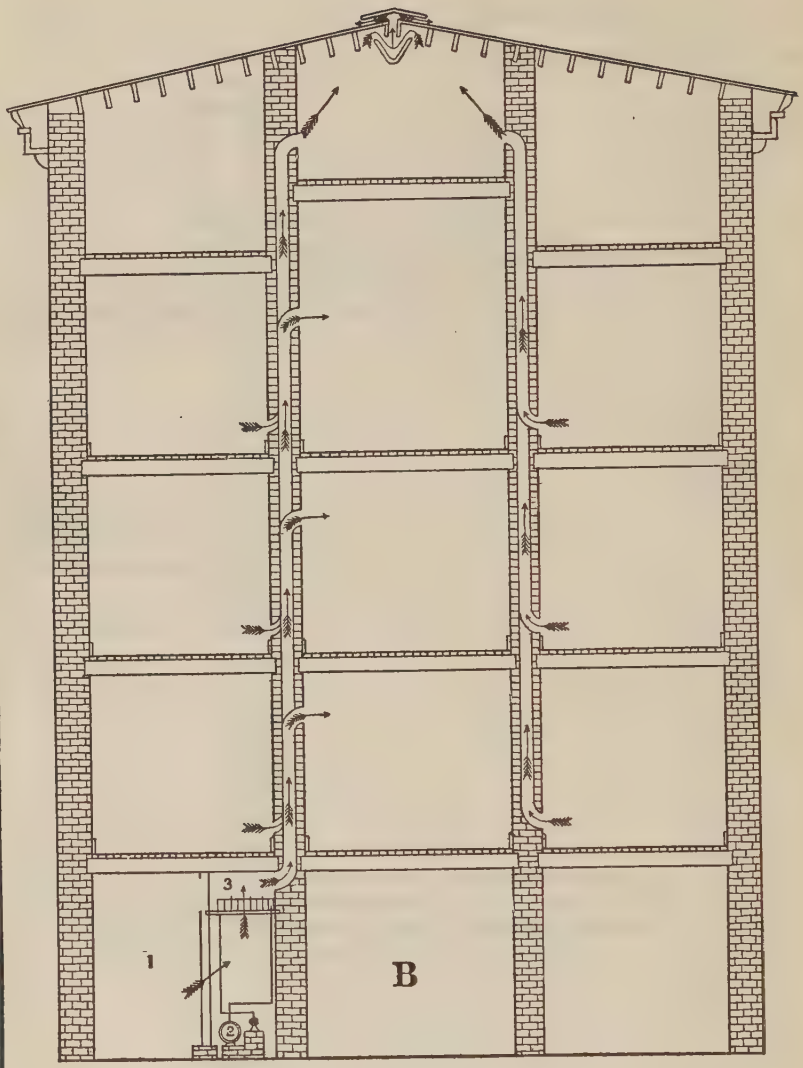
The amount of air delivered by each fan is one thousand cubic feet to each revolution. These fans can be made to furnish any desired quantity. At this institution they supply five millions cubic feet of air per hour, which is a little over one hundred cubic feet of air per minute to each occupant of the house, night and day.

The air *plenum* (1 in plan B) is large enough to contain any quantity of air desired, without the need of a rapid current. The face-areas of the flues, leading from this duct to the wards and rooms, is equal to forty-two inches for each occupant. The area of the exit flues, from the wards and rooms to the attic chamber, is equal to sixty-four inches for each occupant; the exit area through the ridge ventilation equals seventy-six inches for each occupant. Every single sleeping-room is furnished with a flue for the exit of foul air, of sixty-four inches area. Where one sleeping-room is connected with another, the area of the several flues is equal to sixty-four inches for each occupant. The sleeping-rooms receive the air from the corridors at or near the floor. There is no threshold, and some of the doors are shortened at the bottom to allow a space between them and the floor of sixty-four square inches area. In some of the sleeping-rooms the air enters through a register in the bottom rail of the door. By this method an abundant supply of fresh air is secured.

The air, by being compelled to pass over cast-iron radiators through which steam is circulated, on its way from the fan to the occupied parts of the building, is warmed to the degree that is required. These radiators are placed in the *plenum*, and in separate



SCALE 100 FEET TO THE INCH.



SCALE 3/32" TO THE FOOT.

blocks underneath the flues leading from this *plenum* to the occupied parts of the building. There is one flue leading to each story, and a block of radiators for each set of three flues. Each block has an independent connection with the main steam pipe, so that each block can be used separately. Each block is encased on the sides, leaving the bottom open for the free passage of air over the radiators. By this arrangement the air is warmed at the nearest point of its delivery for use, and the heat is not wasted by absorption into the walls of a large general air chamber, and the temperature of the air sent into any special part of the building can be regulated as may be desired, by simply introducing more or less steam into the individual blocks.

By the construction of the radiators and the way they are connected, they make a "steam-coil," and the several blocks are so arranged and connected that steam can be turned upon one-third, two-thirds, or the whole, as the atmospheric temperature may require.

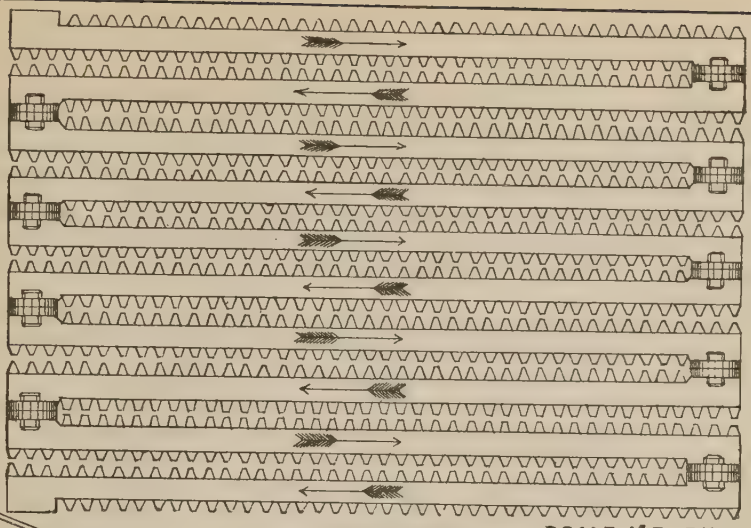
This large body of air entering and being distributed in the manner described, produces very little, if any, current. It is not necessary to raise the temperature of the air introduced higher than one hundred degrees at the point of entrance to the wards and rooms in order to secure a general temperature of seventy degrees throughout. Thus the air is not rarified, expanded, or dried to a degree that interferes with health and comfort.

This system does not require registers to regulate the amount of hot air ingress. The amount of air delivered over each radiating block is warmed to the temperature there required, and as the volume of air delivered is uniform and constant, thorough ventilation is obtained. Ingress registers in the wards of a hospital are sure to be used to *shut off the flow of air* if it was too warm, that being more easily done than to give information to the engineer having control of the heating blocks. Registers are used in the offices and residences of the officers.

It is possible to determine the exact amount of coal necessary to raise a given volume of air one degree, and this gives the key to the necessary amount of coal to be burned in the steam boilers to raise the whole quantity of air introduced to any desired temperature. The engineer, by observing the temperature of the external atmosphere, and knowing the volume of air delivered, can, with sufficient accuracy, supply the necessary amount of heat.

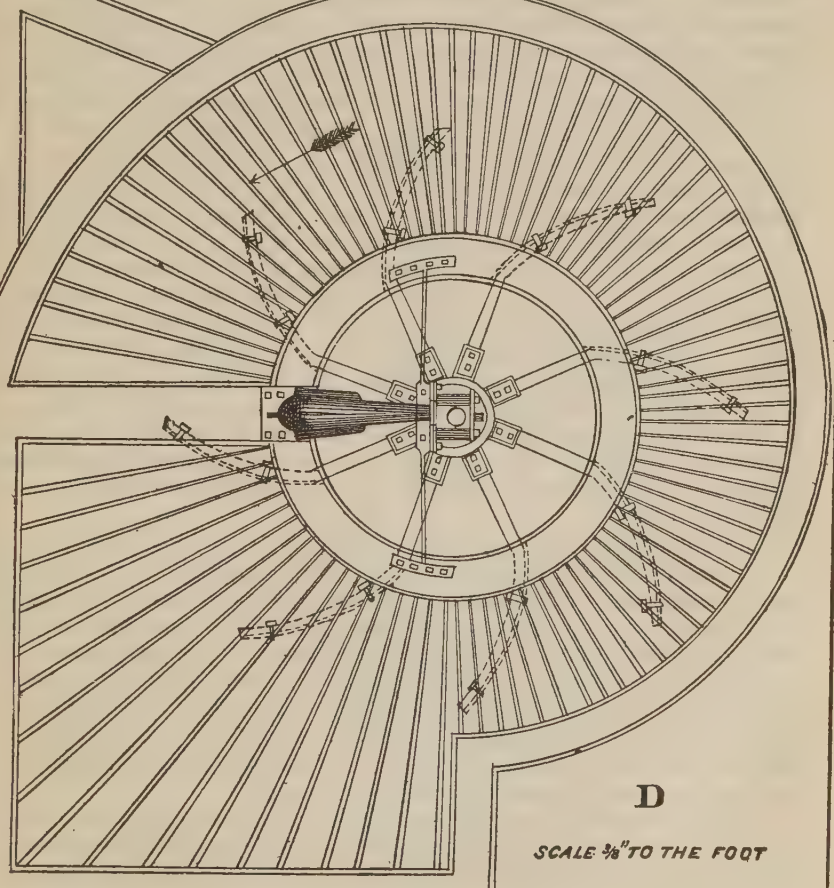
To illustrate: the cubic capacity of the wards and rooms in this asylum is, in round numbers, about 5,000,000 feet. Five million cubic feet of air are delivered by the fans per hour, night and day. Twelve pounds of coal will raise the temperature of this vast volume of air one degree Fahrenheit per hour. The temperature of the wards has been maintained at from 70° to 72° when the outside temperature was 10° below zero. At the same time the amount of coal burned for twenty-four hours, was eight tons and 1,280 pounds, an average of 720 pounds per hour, with 722 occupants.

The Fan.— The fan and its supports are of iron ; the casing, of wood. The rotary or operating part of the fan consists of a shaft with eight radial arms set back on a curve (as shown in the cut), at the extremities of which are fastened iron wind-boards three feet wide and five feet long in the direction of the axis ; the extremities of the wind-boards are six feet from the center and consequently describe a circle of twelve feet in diameter. The shaft extends beyond this casing and rests on pulley blocks, and on the driving side it is lengthened six feet to receive the driving pulley and remove all obstruction to the easy entrance of air to the fans. The motion is imparted by a belt passing over the pulley four feet in diameter with ten-inch face on the end of the shaft. The arms and boards revolve within the wooden casing, the circumference of which, instead of being concentric with the shaft, describes a curve of increasing diameter and forms outside of the wind-boards a channel of constantly enlarging capacity toward the point of delivery. The casing is, therefore, scroll shaped, this space being six inches in front and enlarging to three feet at the bottom. The height of the casing from the floor is eighteen feet. The cross sectional area is equal at the point of delivery to forty-two square feet. The opening in each side of the fan casing for the inlet of air is six feet in area. The whole machinery is placed in a room the floor of which is on a level with the floor of the main air duct, and the air is admitted through a large open space double the area of both inlets and properly guarded. (See plan D.)



C

SCALE 1" TO THE FOOT



D

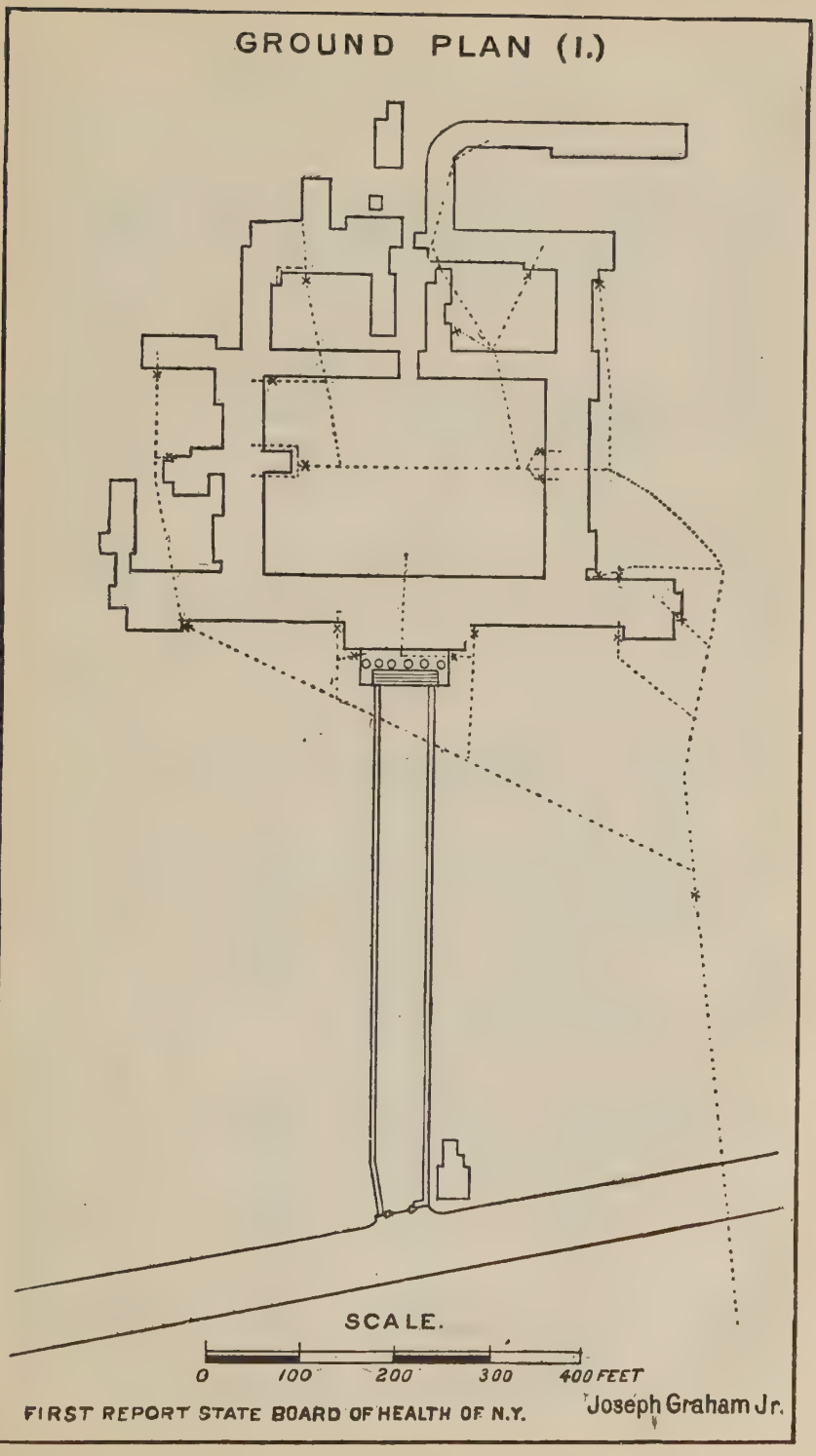
SCALE 3/8" TO THE FOOT

Sewers, with their Ventilation and Traps.— We can safely say that no institution in this country has a more perfect system of drainage and drain ventilation than this. It has been a matter of great study for years on the part of Dr. Gray to make it a success in every particular. Accompanying this report will be found a ground plan of the buildings showing a complete system of sewerage, also a sectional view showing soil-pipes and traps with their ventilation.

The grounds were originally wet, but have been thoroughly underdrained at a depth of three and one-half feet so as to make them entirely dry. The distance separating these drains varies from thirty to sixty feet. The drains from the garden are carried directly to a small stream running through the grounds, and those in the front grounds run into the main drain of the institution at its outward boundary where they are thoroughly trapped. A large portion of the farm is underdrained. The whole ground drainage amounts to many miles. This secures entire immunity from all under-ground collections of water and all forms of malaria. The black lines show the outlines of the walls of the buildings. A skeleton ground plan [Plan I] of the building and sewers is given. Dotted lines show the drains which are egg-shape, the narrowest part at the bottom, to give as deep a flow of water as possible for the small current that constantly flows in a drain, also to have as little breadth as possible at the floor of the drain-pipe, to guard against the lodgment of solid matters. They are laid in water lime and cement; two rows of brick, the first row grouted before the second is laid. Where the drains pass under the house they are cast iron pipe. The points crossed indicate the location of the traps, where all manner of soil and waste-pipes connected with the house enter. It will be observed that the traps are outside of the walls. The system of tapping and ventilating the soil pipe and the drain trap through the roof began to be introduced separately in 1856, and it works so well that the system was gradually extended throughout the whole building with complete success. The waste-pipes from the urinals are ventilated through the roof in the same manner as the soil-pipes.

The institution was opened the 16th of January, 1843, during which year they were entirely exempt from fevers, dysentery or other serious affections of the bowels. From this time down to the year 1847 passed with an occasional death from diarrhœa, all of which time the institution was new and unimpregnated with diseases of a miasmatic nature. But that year they report eight deaths from diarrhœa, at the same time diarrhœa and dysentery affecting more than one-half of the inmates. At this point begins the record of influence of bad drainage, defective ventilation, etc., while the asylum has been in operation only four years.

In the following year 240 cases of diarrhœa and dysentery were reported among the patients, and out of this number thirty-nine died. Together with these there were thirty cases of diarrhœa and dysen-


GROUND PLAN (I.)
SCALE.
0 100 200 300 400 FEET
FIRST REPORT STATE BOARD OF HEALTH OF N.Y.
Joseph Graham Jr.

tery among the attendants, none of which, however, were fatal. This was with an average of considerably less than 500 patients. In the year of 1849–50 there occurred thirty-seven deaths from the above causes, together with typhus fever and erysipelas. In the report for that year particular mention is made as to this last-named disease being connected more intimately with imperfect ventilation than any other. Out of the whole number (twenty-three cases) four died; these are included in the above. In the year 1851 there were 126 cases of diarrhœa, dysentery and erysipelas, and out of this number ten deaths were reported, the managers claiming that these diseases were the ones they had to contend with most frequently, and looked forward to the time when their system of ventilation could be improved so that they would disappear.

The year 1852 closed with 425 patients, and the report shows 117 cases from the above-named causes, and seventy-one of these cases occurred in the months of July and August. The total number of deaths was nine.

This year five miles of tiles were laid down to drain the land and swampy parts of the grounds, and some work was done to improve the condition of the water-closets, bath and sink rooms, and in fact a general overhauling was commenced, which the reports show was greatly needed. Dr. John P. Gray took charge of this institution in 1853, the following year, and it was at this time that the present system of heating and ventilation was commenced in the female department. It is a singular fact that but one death occurred from erysipelas and one from typhus fever during this year, and none from dysentery and diarrhœa, showing plainly the effect of the system of ventilation already commenced.

In the year 1854 Dr. Gray proposed a hospital department for the sick. There were only four deaths from erysipelas and one from typhoid fever during this time.

In 1855 commenced the ventilation of the male department. In the female department, while there were sixteen cases of dysentery and one case of erysipelas, in the male department there were twenty-five cases of dysentery and twelve cases of erysipelas, showing the difference in the prevalence of diseases from bad air, etc., zymotic diseases, etc., on the two sides of the house.

The ventilation having been for some time put quite extensively into operation in the female department of the house, the amount of air supplied to each occupant was 280 feet per minute in summer, and 140 feet per minute in winter.

In 1856 the general health of the institution was remarkably good throughout the year, there being only a few cases of fever from bad drainage. There were no deaths in this year, as well as the year before, from any of the causes before mentioned, except one from fever.

From that time down to 1859, but two cases of typhoid fever, and two cases of dysentery occurred. Commencing with 1860, we find that all zymotic diseases have disappeared, and are not to be found in any of the reports since that time up to the present. It was

SECTIONAL VIEW. (II)
FIRST REPORT
STATE BOARD OF
HEALTH, N.Y.
Joseph Graham, Jr.
1 SOIL PIPES
2 HOPPERS
3 BATHTUBS
4 SINKS
5 FLUSHERS
6 IRON TRAP
7 BRICK TRAP
8 SPECIAL VENTILATING PIPE FROM TRAPS.
SCALE.
0 2 4 6 8 10 FT.
Wood Parsons & Co. Albany, N.Y.

during this year that this system of heating and ventilation was completed which took the place of furnaces that were formerly used for heating the building.

The same marked improvement was made in the system of sewerage, along with the rest.

In connection with this important subject, we furnish a sectional view of the building [Plan II] showing the location of the soil-pipes, hoppers, bath-tubs, sinks, flushers, etc. For instance, let 1 represent Soil-pipes; 2, Hoppers; 3, Bath-tubs; 4, Sinks; 5, Flushers; 6, Iron trap; 7, Brick trap; 8, Special ventilation pipe from traps. (See cut, page 65.)

It will be seen that but one hopper (No. 2) is located upon a pipe for each hall, and the pipe (No. 1) passes out through the roof and carries off all gas as rapidly as it arises over the surface of the water. We witnessed an experiment to show the draft that each of these soil-pipes furnishes: A paper was lighted and introduced into one of the hoppers and the draft was so forcible that it carried the half-consumed paper through the hopper and up the pipe with such force that it proved conclusively that no sewer gas could by any possibility escape into the room. The draft was like that of a chimney furnace on starting a fresh fire. Each hopper is provided with an automatic arrangement (No. 5) for pouring a certain quantity of water into the hopper every few minutes, thus keeping it clean and sweet, and thoroughly washing and ventilating the soil-pipe itself. The traps (No. 6) are also ventilated (No. 8) so that any gas that might possibly get in by back pressure through the daain, or which might be formed, within the trap from the decomposition of materials is at once carried off and out through the roof. The bath tubs (No. 3) are being placed in each story, so as to empty into the soil-pipe sewers, and keep the pipe constantly washed out. The ordinary sinks (No. 4) used in the bath rooms, and in the water-closets and those used for washing out chambers, etc., empty into the back of the hoppers, so as to economize all that water flow and use it for cleansing purposes.

The water supply is abundant, excellent and permanent. It is obtained from springs which are very favorably located, about a mile and a quarter south of the institution, the water from which is conducted to the asylum through iron pipes. This new supply was added in 1869, and since that time no complaint has been made as regards the scarcity of water supply. The institution receives about 80,000 gallons daily. The flowing yield is about 170,000 gallons each day. It is pumped up into the building by a water wheel, supplied by water from the Chenango canal.

Respectfully submitted.

JAMES G. HUNT, M. D.,

Chairman of Committee on Public Institutions.

REPORT OF STANDING COMMITTEE ON SANITARY LEGISLATION, RULES AND REGULATIONS.

The following report, made by this committee, was adopted by the Board November 10, 1880:

Proposed Model Sanitary Ordinances, Regulations and Orders.

The State Board of Health, having, by resolution, referred the subject of model sanitary ordinances to its standing committee on sanitary legislation, rules and regulations, the Attorney-General of the State, as chairman of that committee, reported to the board upon this subject, November 10, as follows:

A difficulty is encountered on the threshold, in recommending any code of sanitary ordinances or regulations that shall apply to all localities and local boards of health, for the reason that the powers conferred by statute with regard to the subject are not uniform as to cities, incorporated villages and towns; the cities have special charters, conferring special powers and privileges, and a sanitary code cannot be recommended that will apply to all the cities, but one must be provided conformable to the statute governing the particular city to which it is to apply.

A uniform code cannot be recommended for all incorporated villages, as some villages have special charters from the legislature, and the provisions of general acts for incorporating villages do not apply to them.

Again, there are two general acts for the incorporation of villages, under which most of the villages of the State have been incorporated; the first in point of time was chapter 426 of the Laws of 1847; by that act the trustees of the village were authorized:

"To prohibit any person from bringing, depositing, or having within the limits of said village, any dead carcass or other unwholesome substance, and to require its removal or destruction by any person who shall have on or about his premises any such substance or any putrid meat, fish, hides or skins of any kind; and, on his default, to authorize the removal or destruction thereof by some officer of said village; and to abate any nuisance within said village injurious to the public health."

The trustees were given the power to enforce the observance of this regulation, by attaching a penalty to its violation not exceeding $25 for "one violation."

The act of 1870, chapter 291, repealed the act of 1847, excepting two sections (which have no application to any question before us), *except* as to villages which *then* had been incorporated under the act

of 1847, and as to those villages, the act still remains in full force, unless those villages have been reincorporated under the act of 1870, which could be done by an election in the village, conducted in the manner prescribed by the 30th and 31st sections of title 8 of the act of 1870.

It will thus be seen that in all villages incorporated before 1870, under the act of 1847, that have not been reincorporated under the act of 1870, the enlarged powers given by this last act to the trustees of the village, and to boards of health of villages, have no application.

Therefore a sanitary code, warranted by the act of 1870, can have no application to villages incorporated under the act of 1847, excepting only so far as it is warranted by the statute applicable to them.

But chapter 324 of the Laws of 1850 applies to all the "boards of health now" [then—April 10, 1850] "organized in any city or village in this State, constituted under this act;" and under said act the board of health consists, in cities and incorporated villages in which a board of health on April 10, 1850, was not duly organized, of not less than three, nor more than seven persons, with a competent physician to be health officer. By the act passed April 25, 1867 (chap. 790), the cities and villages within the metropolitan district were exempted from the operation of the act of 1850.

In the cities the board is to be appointed by the common council; in the villages by the trustees thereof, and the duty is imperative to make the appointment.

In the towns, the board of health, when it exists, consists of the "supervisor and justices of the peace, or the major part of them."

In cities and villages the statute requires that a board of health should, at all times, be in existence and on duty.

In the towns the board of health only exists "whenever, in the opinion of a majority of such board the public good requires it," and then "they shall appoint some competent physician to be health officer;" so, in order to have boards of health organized in the towns, the supervisor and justices must, as it were, organize and appoint themselves, and decide that a board of health is necessary, and appoint a physician for health officer; until this is done in the town, no board exists to adopt any sanitary orders or regulations, or to do any of the acts authorized by this statute.

In villages incorporated under the act of 1870, the board of health consists of "one or more health commissioners who, with the president (of the village), shall constitute a board of health of the village." The commissioners are appointed by the trustees, so it is important to bear in mind that boards of health in villages incorporated under the act of 1870 are not constituted in the same way as in other villages and in cities; under this statute, too, the power and discretion is vested in the trustees to appoint health commissioners; it is not made a *duty*, as in the case of other incorporated villages and the cities.

With these general remarks we come to the question as to what ordinances, orders or regulations should be recommended to the local boards of the cities, villages and towns within the State.

The committee will not undertake the work of recommending to each city and village which has a special charter, ordinances to be adopted as warranted by those charters respectively.

They will only venture to recommend as to villages incorporated under general acts, and towns, and as to them some general recommendation can be made without confusion or incurring the danger of leading them into mistakes.

So far as relates to ordinances recommended as warranted by chapter 324, Laws of 1850, they can apply to cities in the State not included in the Metropolitan District, and villages having special charters; and we think it may be safe to assume that all the ordinances hereafter recommended, as far as they go, apply to the cities not excepted, and to villages.

Of course the boards of health of those cities and villages can adopt such other ordinances as are warranted by their charters. Under the act of 1850, two kinds of orders or regulations are contemplated:

First. Orders of "general obligation" shall be made "in such manner as to secure early and full publicity thereto;" and,

Second. "To make, without publication thereof, such orders and regulations in special and individual cases, not of general application, as they may see fit concerning the suppression and removal of nuisances, and concerning all other matters in their judgment detrimental to the public health, and to serve copies thereof upon any occupant or occupants of any premises, whenever any such nuisance or other matter aforesaid shall exist, or by posting the same in a conspicuous place on such premises." From the nature of things the boards of health will be mainly called upon to meet sudden dangers and exigencies, and must provide for them as they arise. They cannot anticipate them and provide for them by "general orders" in advance; so that the chief work of such boards will be done through the medium of orders specially made at the time of emergency; consequently the general orders or regulations that take the character of by-laws must be necessarily limited, and few in number, and very general in character.

The committee have consequently recommended but a few "general" orders and regulations, and such only as they have no doubt as to their legality and propriety, and in doing so have adopted with amendments and modifications a portion of the "Model Sanitary Ordinances" recommended to this Board by Col. W. P. Prentice, of New York, with additional ones.

Publication of these "general" regulations by the several boards of health, according to the statutes, must be made before they have any binding force. Under the act of 1847, the ordinances of the *trustees* must be published for two days in a newspaper printed in the village, if there be one, and if there be none, a printed copy thereof must be posted in ten of the most public places in such vil-

lage for at least four days. This only applies, as before said, to villages incorporated under that act, and not re-incorporated under the act of 1870.

By the act of 1870, section 27, the ordinances of the *trustees* shall be posted in three public places in the village ten days before they shall take effect; but by that act the board of health of the village shall possess the powers conferred by chapter 324 of the Laws of 1850, and be subject to it.

We are of opinion that the publication of the orders and regulations, in all cases of villages incorporated under the acts of 1847, 1870, and in the towns, in general, is controlled by chapter 324, Laws of 1850, which, as before said, provides that they shall be published "in such a manner as to secure early and full publicity thereto." The manner of publication is thus left to the boards of health respectively.

In towns and villages in which a newspaper is published, it would be prudent to publish in the newspaper for ten days.

In towns and villages where they have no newspaper, it would be sufficient to have posted up in a number of public places in the town or village, ten in number, in villages incorporated under the act of 1847, and at least five in number, in villages incorporated under the act of 1870, and in the towns a legibly written or printed copy thus posted will be sufficient. The board of health in each case must, by resolution, direct the manner of publication before it is done.

Expenses of Publication.

All expenses incurred by the several boards of health "shall be a charge upon their respective cities, villages and towns, to be audited and collected as other city, village and town charges are respectively."

Nuisances.

In exercising the power conferred upon the boards of health "to suppress and remove nuisances," care should be taken that they do not exceed their powers or assume any doubtful powers. The nuisances which the board have power to abate are only such as are so *per se*, that is, positively so, such as a ditch dug, or a fence placed across a public highway, or an obstruction placed in the bed of a navigable stream, or vessels, clothes, or goods, charged with effluvium and infection of persons contagiously diseased; also dead, decaying and putrid vegetable or animal matter. (See 31 Barb. 452.)

But where a fair question can arise as to whether the thing complained of is a nuisance, or where it may or may not be a nuisance according to circumstances, then it cannot be summarily abated, but the question must be tried before the ordinary judicial tribunals, where all parties interested can be fully heard and have, if they desire, the benefit of a trial by jury.

(Signed) HAMILTON WARD, *Attorney-General,*
Chairman of Standing Committee on Laws, etc.

NOTE. — The following outlines of Sanitary Orders and Regulations, as recommended by this Committee, having been maturely considered by the State Board of Health of New York, have been adopted as expressing the judgment of this Board, and they are respectfully submitted to local sanitary authorities and recommended for their adoption.

(Signed) E. M. MOORE, *President.*
(Signed) E. HARRIS, *Secretary.*

MODEL SANITARY REGULATIONS.

Orders and Regulations that may be adopted by Local Boards of Health.

The following are the orders and regulations of a general nature that are recommended as proper to be adopted; they apply to all *villages* incorporated under the general acts for the incorporation of villages of 1847 and 1870, and the acts amendatory thereof, and to the *towns* of the State (except such of these orders and regulations as are recommended as appropriate to cities and villages *only*), and all *cities* and villages in the State (except the Metropolitan District) that have special charters, provided they are *not in conflict* with these charters.

ORDERS AND REGULATIONS *adopted by the Board of Health* for the ——————— of ———————,* county of ———————, State of New York.

SECTION 1. Whatever is dangerous to human life or to health, whatever building, erection, or part or cellar thereof is overcrowded, or not provided with adequate means of ingress and egress, or is not sufficiently supported, ventilated, sewered, drained, cleaned or lighted, and whatever renders the air or food and water or drink unwholesome, are declared to be nuisances, and to be illegal; and every person having aided in creating or contributing to the same, or who may support, continue or retain any of them, shall be deemed guilty of a violation of this ordinance, and also be liable for the expense of the abatement and remedy therefor.

§ 2. No privy-vault, cess-pool or reservoir, into which a privy, water-closet, stable or sink is drained, except it be water-tight, shall be established or permitted within fifty feet of any well, spring or other source of water used for drinking or culinary purposes. And every privy-vault and cess-pool shall be cleaned, and the contents thereof removed, at least once before the first of May in each year.

§ 3. All sewers or drains that pass within fifty feet of any source of water used for drinking or culinary purposes shall be water-tight.

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* Insert name of city, village or town.

§ 4. No house-offal, dead animals or refuse of any kind shall be thrown upon the streets or left exposed by any person; and no butcher, fish-monger or vendor of merchandise of any kind, shall leave any refuse upon the streets, or uncovered by earth, upon the lots of this* ——————; and all putrid and decaying animal or vegetable matter must be removed from all cellars and out-buildings at least once in each year, and on or before May first in each year. Whoever shall violate any of the provisions of this section shall be liable to a penalty of twenty-five dollars for each and every offense, in addition to the liability to fine and imprisonment as for a misdemeanor, as provided by law.

§ 5. No tanner, refiner, or manufacturer of gas, starch, leather, chemicals, fertilizers, or of any product whatsoever, shall permit or have any offensive substance or water, or other liquid, whether refuse, or for use in any trade or otherwise, on his premises, or throw, deposit or allow to run, or to be thrown into any public waters, street or public place, lake, pond, river or stream, any offensive or deleterious liquid, or any gas, tar or refuse, or any offensive matter; or befoul or render impure any natural stream of water, or fail to use the most approved, and all reasonable, means to prevent the escape of smoke, gases and odors.

§ 6. No meat, fish, birds, fowls, fruit, vegetables, milk, and nothing for human food, not being then healthy, fresh, sound, wholesome, fit and safe for such use, nor any animal or fish that died by disease or accident, and no carcass of any calf, pig or lamb, which, at the time of its death, was less than four weeks old, and no meat therefrom shall be brought within the limits of *—————— or offered or held for sale as food anywhere in said *——————. Whoever shall violate any of the provisions of this section shall be liable to a penalty of twenty-five dollars for each and every offense in addition to the liability to fine and imprisonment, as for a misdemeanor, as provided by law.

§ 7. Any householder in whose dwelling there shall occur a case of cholera, yellow-fever, typhus or typhoid fever, scarlet-fever, diphtheria or small-pox shall immediately notify the board of health of the same; and until instructions are received from the said board, shall not permit any clothing or other property that may have been exposed to infection to be removed from the house. Nor shall any occupant change his residence elsewhere without the consent of the said board during the prevalence of any public danger from said disease; and all physicians and other attendants upon any person sick with small-pox, cholera, typhus, typhoid or scarlet fever, diphtheria or other disease dangerous to the public health shall forthwith report the same to the board of health. And it shall be the duty of such physicians and attendants to avoid exposure to the public of any garments or clothing about their own persons that may have been infected from exposure to any diseases.

§ 8. No person or article liable to propagate a dangerous disease

* Insert name of city, village or town.

shall be brought within the limits of this city (or village) without the special permit and direction of the board of health thereof; and whenever it shall come to the knowledge of any person that such person or article has been brought within such limits he shall immediately give notice thereof to the said board, together with the location thereof. No person shall, within the built-up portion of a city or village, without a permit from the board of health thereof, carry or remove from one building to any other, or from any vessel to the shore, any person sick of any contagious disease. Nor shall any person, by any exposure of any individual sick of any contagious disease, or of the body of such person, or by any negligent act connected therewith, or in respect of the care or custody thereof, or by a needless exposure of himself, cause or contribute to, or promote the spread of disease from any such person, or from any dead body. And it shall be the duty of this board to order such separation and isolation or domestic quarantine of the sick from other persons not necessary as attendants, and also such special care and disinfection as shall be needed in order to prevent the spreading of such disease to others.

§ 9. There shall not be a public or church funeral of any person who has died of small-pox, diphtheria, scarlet fever, yellow fever or Asiatic cholera; and the family of the deceased is required to limit the attendance to as few as possible, and to prevent the presence, so far as they are able, of those who have not had the disease of which the deceased person died; and it shall be the duty of householders and all persons concerned, where a death occurs from any contagious or pestilential disease, to prevent needless assembling in the apartments and house, where such diseases are, of all persons liable to become infected thereby.

§ 10. The keeping and slaughtering of all cattle, sheep and swine, and the preparation and keeping of all meat and fish, birds and fowls, shall be in that manner which is, or is generally reputed or known to be, best adapted to secure and continue their safety and wholesomeness as food; and every butcher and every person owning, leasing, or occupying any place, room or building where any cattle, sheep or swine have been or are killed or dressed, and every person being the owner, lessee or occupant of any room or stable, where any cattle may be kept for market, public or private, shall cause such place, room, building, stall and market, and their yards and appurtenances to be thoroughly cleansed and purified, and all offal, blood, fat, garbage, refuse, and unwholesome or offensive matter to be therefrom removed, at least once in every twenty-four hours after the use thereof for any of the purposes herein referred to; and shall also, at all times, keep all wood-work, save floors and counters, in any building, place or premises aforesaid, thoroughly painted or whitewashed.

§ 11. No animal affected with an infectious or contagious disease shall be brought or kept within the limits of this *——————

* Insert name of city or village.

except by the permission of the board of health thereof. No animal having the glanders or farcy shall be kept, used or retained or be permitted within the said limits.

The following orders and regulations are recommended as appropriate to *cities and villages only*, that can be adopted by the boards of health thereof, in addition to those above provided:

SECTION 1. No person or company shall erect or maintain within the limits of *———————— any manufactory or place of business dangerous to life or detrimental to health, or where unwholesome, offensive or deleterious odors, gas, smoke, deposit or exhalations are generated, without the permit of the board of health; and every such establishment now existing shall be kept clean and wholesome in every particular, so as not to be offensive or prejudicial to life and health.

§ 2. Every hotel, lodging-house, tenement-house, workshop or other building where several persons are employed, factory, school, church, theater, and every public building, shall be open to the inspection of the health officer and of the officers of the board of health. Every owner, lessee, tenant, occupant or person in charge or having any care or responsibility of any such building or of any public building who shall have any knowledge or information of any defects therein, whereby any avoidable peril may come or happen to any person being properly in such building, or having any knowledge or information of any thing prejudicial to life or detrimental to health, or of any nuisance, or of any thing likely to become such, in or about such building or the premises thereof, shall promptly give notice of the same to the board of health, and in such notice as fully as possible describe the locality. The remedy in respect to such building or its premises, or the repairs and improvements thereof, or the abatement of any nuisance which the board of health may at any time order or direct, shall be at once provided by the person or persons who shall own or have in charge or be responsible for the premises described in the order or direction of the board of health.

§ 3. No milk which has been watered, adulterated, reduced or changed in any respect by the addition of water or other substance, shall be brought into, held, kept or offered for sale at any place in the city (or village) of *————————; nor shall any one keep, have or offer for sale in the said city (or village) any such milk.

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* Insert name of city, village or town.

WHAT THE STATE OWES TO THE PEOPLE.

A Discourse before the American Public Health Association at its Eighth Annual Meeting in New Orleans, December, 1880.

By Hon. ERASTUS BROOKS,

One of the State Commissioners of Health of New York.

"Public Health is Public Wealth."

That "the world is governed too much," is a maxim that may wisely be accepted by both the people and the government; and especially is the maxim true in a republic like our own, where the people, when notified of their duty, are reasonably considerate and intelligent. The declaration of independence, the constitution of the United States, and the constitution of the several States, all begin with some reference to the people's rights and welfare. The great object of government is the diffusion of knowledge, and the enactment of laws for the regulation of States, communities and persons; and among the first of these duties are provisions of law for the safety of the people. To secure "life, liberty and the pursuit of happiness" is a principle of government older than the constitution, and as such it was embodied in the first record of our national existence. It is safe, therefore, to say in the beginning of what we have to present to the American Public Health Association, that there can be no real life or true happiness where the public health is not provided for by law; and that the State is only in the discharge of one of its first duties when it seeks, under reasonable laws, to maintain the chief end of its existence.

In the Congress of the United States, and in the legislatures of the several States and Territories, it is exceptional to find members of the medical profession. Here and there only, it is also true, are found men who unite an interest in the political and physical welfare of the State. In a certain way we all seek that "good digestion which waits on appetite," looking for "health on both." But far more than in what we eat and drink and put on and off, we digest our words and thoughts. Our laws are digested and have been from the order of the Roman Emperor Justinian, now nearly 1,400 years since, to the present time. In food for the body, as in light and air for the abodes of men, the work to be done is to arrange, classify, dissolve and distribute whatever in the one case is

nutritious from whatever is otherwise; and in preparing, if I am correct, whatever is put into the stomach for conversion into blood and into chyle or chyme; and in the other case the work to be done is to arrange, classify, work over and distribute, for the use of others, whatever is necessary in books and letters for the instruction of mankind.

For more than forty-five years of my life, as proprietor, editor and legislator, I have been engaged in the second class of this kind of work. To most of you belongs the more important duty which may be presented in the three aspects of reducing the mortality among the people at large, of saving the people from physical pain, and of curing the sick. If to do all this is not to make "a voyage of discovery" and "a circumnavigation of charity," then no such voyage can be taken in the journey of life. I can recall no work of equal value, nor any kind of labor calculated to promote so much human happiness.

In political governments the people are bound to seek and to enjoy, if they can, their political preferences for principles and for persons. Whether in majorities or minorities one side will govern and the other side will obey. The two sides are essential to the welfare of the State; but while this is true there are in all States and communities, unities and necessities, still more essential for the public good, and upon which there can be no safe divisions of opinion as to the proper uses of the authority of the State. We may have diversities of opinion as to the causes of disease, remedies for their cure, as to climate and exposures, as to habits of living, the safety of buildings, the best methods of drainage, sewage and ventilation in dwellings and work-shops; but science and experience will in time solve all these differences into one practice or system, while in all that belongs to duty to be performed, or to culpability for neglect of duty commanded to be done in questions relating to the public health, there can safely be no divided counsels.

I place the subject of health as among the first, if not the very first, in the science of political economy. It is a question which belongs to the wealth of the nation and to the prosperity of the people. The man or scientist who is capable of discovering or curing disease, and whom by custom we define as a physician, is, in the established meaning of words, an experimentalist in physics and a natural philosopher. The doctor, in brief, is a person recognized, in law and practice, as one skilled in the art of healing the sick through the agency of proper medicines, and it is this healing of disease in its effect upon communities which covers and governs a material fact in political economy.

We know what ravages yellow fever has produced in this country and in the world, how many lives it has destroyed, how much misery it has produced and distributed, and how much wealth it has diminished. The lessening or removal of the prevalence of this great calamity has been partly the work of physicians and a large share of it belongs to the nursing of liberal and intelligent men and women. This work, often a volunteer service, was inspired by the

noblest motives, and has again and again, and especially in this section of the country, produced the grandest results.

The State politically, but not in the sense of party politics, and the people personally, in every sense I need not say, have the deepest interest in what is called State preventive medicine. Disease among a large class is often but another name for poverty, pauperism, orphanage and bankruptcy. In Philadelphia in 1871–72, some 4,500 people perished from small-pox. The reported loss in business there at the time, and from this disease, was $16,000,000, besides a cash value in human lives of $5,000,000 more. New York city was also a great sufferer at the same time and from the same cause, while Baltimore, Boston and Providence and other cities resisted the disease and prospered greatly, owing to a timely and thorough vaccination of the inhabitants.

The State imposes certain qualifications not only upon dealers in drugs, but upon physicians, before they can practice in the great art of prescribing suitable remedies for disease. A more important State duty is the enactment of wholesome laws to prevent disease. This is done without infringing upon the personal or political rights of any citizen.

The first duty is to remove the cause of all pestilences and epidemics, foreign or domestic; and where these unfortunately prevail the second duty is, by vigorous administration of proper laws to prevent their spread and put an end to their existence. When the pleuro-pneumonia came into the United States from Holland — once the great depot of this disease in Europe — and when, to an alarming extent, it was carried into England, the realm there, and the State and the Federal governments here, did not hesitate to act forcibly and promptly for its removal. Holland, profiting by experience and energy, reduced by inoculation, the disease to one or two per cent, and finally stamped it out. If Massachusetts and other States have accomplished a great work in preventing the lung plague in cattle, what ought not all the States to do in preventing even a worse disease in men, women and children? To a woman of Massachusetts is due the honor of suggesting the first Board of Health in the United States.

A decent care for the people by the State and a decent respect for the government by the people establishes reciprocal relations which no party can neglect. The lives, health and happiness of all classes of citizens depend upon these mutual observances of duty; and hence the existence of State Boards of Health, created by law to present, discuss and enforce obedience to the laws passed. The law, in all its provisions, is for the common good. It is a simple application of the science of medicine in the form of remedies or preventions to the people of the State. It teaches mankind not only the inestimable blessings of light and air and water, of ventilation and drainage in dwellings and places of business, but the absolute need of the best use of these great gifts in nature, chemistry and discovery.

It is demonstrated in the city from which I come, by the presi-

dent of the city Board of Health, that thousands of young lives have been saved yearly for ten years and more by the enforcement of health laws passed by the State. Recent laws relating to the tenement-houses will impart great comfort to their poor occupants and add largely to the number of lives saved. The death-rate of the city now numbers between 27,000 and 30,000 each year, and one-third of this number of lives could be saved if the health laws could be enforced. Eminent physicians, verbally and in their written reports, assure me that one-third or more of the prevailing sickness in town and country could be prevented by the observance of sanitary laws. Mr. Edwin Chadwick stated three years ago to the British Scientific Association, that both sickness and death-rates had been reduced one-third by the practice of sanitary laws, and that the death-rate in the old districts had come down to sixteen or seventeen in each thousand deaths; and he declares that in new districts, with no overcrowding and with a proper supply of water and surface cleansing, that the death-rate can be reduced to ten in the thousand, which is nearly two-thirds less than the mean death-rate among the general people.

More remarkable than even this encourgaging promise, but resting upon the common sense rules of fidelity in public service — and adding, perhaps, a becoming sympathetic interest in the happiness of mankind — is the statement that in well-governed institutions for children between the ages of three and fifteen years, the death-rate can be reduced to two-thirds of the number generally prevalent, or to three in each 1,000 children, and with a corresponding immunity from all common epidemics. Even in the British reformatory prisons, by the careful use of preventive medicines, the death-rate has been reduced to three in the thousand, with a general exemption from diarrhœa, dysentery, typhus fever and eruptive diseases. The diseases belonging to the respiratory organs are also reduced by care to one-half.

The cholera epidemic, which prevailed in England in 1832, frightened the people there into the necessity of securing more of the decencies of life than had before been enjoyed. The panic of a scourge, like most other panics, prompted many of the people to put on their thinking caps, and from the consequences of the cholera came, in the course of ten, twelve and fifteen years valuable government reports and laws. These laws, if Dr. Bowditch be correct, are in advance of the laws of all other countries; and one man, Dr. Farr, has been the bright particular star in this work of sanitary reform, not only for Great Britain, but in many other parts of the world. If disease spreads by contagion, so also good example and benevolence inspires imitation and secure their reward. The great pioneers of the world in discovery and work have proved its greatest benefactors, and to the good beginnings at home and abroad we owe to-day the existence of twenty-four State Boards of Health in the thirty-eight States of the Union, and all these have been established within twenty years. Lord Derby long ago declared that "no sanitary improvement worth the name will be

effective, whatever acts you pass or whatever powers you confer upon public officers, unless you can create an intelligent interest in the matter among the people at large." Lord Beaconsfield spoke the truth for his own country when he said, as prime minister of England, three years since, that "the health of the people is the first duty of the statesman." This sentiment is at least equally true in a country of such enormous proportions as our own, and daily increasing, not only from its own inherent growth, but as the destined home of millions of people now in the world.

The government and the States are not asked for what so often excites and thrills the body politic by the possession of place, patronage and power, but simply to engage in the paternal works of saving the lives and promoting the health of the people. The appeal is to the common sense and practical humanity of members of Congress and of the legislatures of the States, some of whom as in Mississippi, Alabama and Texas have already performed a work of moral and social importance, not only to the people of their own States, but in the way of example to all non-acting States. The motives for the needed work are the highest of our best natures, "since the greatest good of the greatest number of the people," is all that is asked.

If, when governed by such considerations, the people refuse to act, the law here as abroad must take its course, and penalties imposed for its violation. Nor is it enough, as expressed a hundred years ago and more by Edmund Burke, that "men *mean* well. It becomes them to DO well." You are asking nothing new of States or Government. Centuries ago the republics of Greece and Rome had their sanitary laws, and the argument then as to-day, as a part of the important work of the period, was that physical culture would secure physical health. The old Romans had their systems of ventilation, drainage and sewerage, their splendid aqueducts, baths and pavements, and all of them promoted the comfort, convenience and health of the people. Sanitary law also was a part of the Mosaic law, and in practice better at times than the customs in very many of our own American towns and cities in the closing years of the nineteenth century of the Christian era.

Among the lost arts and blessings of mankind unfortunately were the lost codes of laws relating among other things to the public health. The code of Justinian and the laws of Lycurgus, with laws for justice and health went into decay, and for a thousand years and more books and learning, and in a certain sense, deeds of practical charity were confined to the monks. It was long a forgotten lesson among general teachings that "cleanliness was next to godliness," and therefore a very close neighbor to all kinds of practical piety. Hence, and clear up to and far into this nineteenth century, came agues, malaria, small-pox, cholera, scurvy, plagues and pestilences, and all the inherited ills of life to which, from negligence and ignorance, flesh and blood are exposed. Happily for the world, public opinion is now aroused in the interest of the public health, and the subject

reaches us to-day in the threefold form of economy, thrift and morals.

If, as alleged by way of criticism, the health service is costly, it can be proved to be the best possible investment to meet the cost. We begin in the New York State Board this year with an appropriation of $15,000, and it may be more or less hereafter. The City Board of New York asks for the year 1881 the sum of $253,363, and it is money so well invested that in buildings, institutions, in saving health and lives, it will save more money to the city, in income and taxes, than any investment of the most skillful financiers in Wall street. If to this result the money value of life is counted, the five or six thousand lives yearly saved will run into some millions of dollars. In Great Britain they place this kind of value upon human existence, just as we say in the United States that the cash value of every able-bodied immigrant from the Old World is $1,000. There Dr. Farr — perhaps the highest authority in the Old World — placed, in his reports as the registrar-general of the government, the money value of each man, woman and child in the United Kingdom at $795. The neglected preventable deaths in England and Wales during the school period, apart from infant mortality, makes a loss to the State of $95,000,000. The estimated value of lives lost in the cases of preventable deaths is estimated at $200,000,000 in a population of fifty millions of people in the United States alone. The British life insurance companies and friendly societies also give the money value of work lost by sickness. For every death there were, as proved on careful investigations by the government, two persons already sick and disabled, thus making a loss for each death of 730 days in each year. This result is reached by placing the minimum of the entire population at the sum of $795 here named, and to these figures are added 50,000 lives annually in the school age in England and Wales alone, which might be saved. But such statistics are exhaustless, and I must soon leave them for more practical conclusions.

In considering the subject of State law and personal work it will be wise to recognize the principle in regard to disease — especially is this true in cases of quarantine — that it is not places, but *principles* which secure public health. This rule applies alike to the ship, the shop and the home. Ship fever, under proper treatment and practice, has become what Dr. Vanderpoel has called almost a mythical disease, and by simple cleanliness it is now easily mastered.

Cholera, though not mastered by being stamped out in the same way, is often under control, and its spread into towns and States and along the coasts and rivers can be prevented. It always comes from importation. Importation, if need be, can be forbidden, and by law and care its spread, if it should come, can be prevented. When in 1832, 1848–49, 1854, 1865–66, it entered the United States and Canada, it moved as fast as travelers could be borne by steam to the far West, and left its footsteps of sorrow all along the road, from New York and Quebec. So also in 1848 it entered New Orleans from Havre, and forced its way all along the Mississippi, reaching towns

and cities 1,000 miles apart, and, surviving the winter, it pursued its ravages over land and water in 1849–50. Had the United States, or Louisiana alone, possessed powers now given under existing laws, no such disaster could have occurred.

Sanitary laws properly executed, I need not say in this place, have prevented and can prevent, the spread of cholera. The law, however, must be supreme, and not only supreme but cover districts, precincts, towns, counties, States and governments, even to the interposition of international authority. There must be the *cordon sanitaire*, as along the vast frontiers of Russia, and maritime law in the hands of faithful officials, and these officials must be sanitary officers, as we have seen them upon the Red sea and the Mediterranean, at Medina and Mecca, keeping back and pushing forward the hundreds of thousands of Mussulman pioneers, who, but for the law and its vigilant observance, would bear disease and death wherever their footprints are found.

What John Stuart Mill calls "the limits of the province of government" we must agree, whether spoken of the State or of the citizen, excludes no good work. It may and should exclude all those needless forms of non-intercourse common to the middle ages and in later periods of time, and all oppressive methods of administration, as when petty despots govern the people; but whatever is needed for the absolute good of the people in establishing and maintaining the public health must be done. If the law is a bad one, repeal it because it is a bad law, or amend it until it becomes wise and timely. In New York we have a compulsory law requiring vaccination, but it has been a dead letter except in a single city, and vaccination is generally reduced to deeds of charity or to simple individual volition, even when the public welfare requires obedience to the public statute. It is the cost to the State that some people complain of, but as a question of State economy I hope I have removed this objection. The real State cost in all the United States at present is less than $5,000 for each million of inhabitants, and the saving covers the cost ten times over. The civil war is reported to have destroyed 800,000 persons. Sickness wastes more than war — 20,000 a year in London and 120,000 in the United kingdom, and if recorded figures from medical men are true 700,000 years of individual human life are yearly lost by preventable neglect among the 5,000,000 of people in the State of New York, and 70,000 years of human life are also wasted every year there by sickness, and New York is no worse off than other States of the Union. These lives fall short ten years each of what they should be. So in England also we read the important truth that in the healthy districts of the kingdom persons who reach the age of twenty years pass on to the good old age of three score and three years and nearly a half; while in the general districts death comes within forty-five years. The annual money loss of this single death record, coming from ignorance, neglect and crime, is stated at nearly $50,000,000, besides the loss from impairment of health and from poverty among those not posi-

tively dead, for each death there is an average of twenty persons who are sick.

When it is known that in small-pox, isolation and vaccination provide certain cure for a loathsome disease, the existence of which is concealed where it notoriously is, the law or its officers are at fault. When it is also known that bad air produces bodily and mental disease, and that proper ventilation, heating and water supply are remedial measures it is the duty of the law, put in practice, to point out and remove the evil. The law, in some of our cities at least, prescribes where houses shall be built of brick or stone only, and if it is a wise law, may not the construction and drainage of dwellings and workshops also be regulated by law? Mr. Edwin Chadwick says that by following out a correct principle three houses may be well drained at the present cost of one, and Mr. Edward Atkinson, also good authority, declares that unsafe buildings cost more to construct than fire-proof buildings. It is proposed in England to guarantee dwellings as safe to live in on the score of health, and simply by evidences of proper construction and drainage. When sewer gas poisons the blood and produces diphtheria, dysentery and malaria in other forms, who shall condemn any proper law intended to prevent poison and self-inflicted murder? So in regard to adulterations of food. Take, for example, the simple article of candy, much of which is reported to be made from grape-sugar, glucose and "terra alba," the latter being sold at one cent a pound, and the former at four cents a pound, where granulated sugar costs by the barrel ten and a half cents. The cheaper candy may be impaired by impurities, or depreciated in value, from fifty to seventy per cent. It is a public duty to resist all impurities, both in the food we eat and in the contaminated air we breathe; in all dwellings, and all work-shops, and in all that is around them; and let me say in speaking, alike for the State and citizen, that "obsta principiis" is the only safe rule of action. When the people of Great Britain discovered that more than one hundred articles were adulterated, the British Parliament in 1815 passed the best law extant, and since known as "the Sale of Food and Drugs Act."

This subject addresses itself to the hearts, minds, and bodies, and estates of every man and woman in the land. The real wealth of a nation is counted not in mines of gold and silver and coal, nor in the more useful metals of iron, lead, copper and tin, nor yet in the millions of acres of land cultivated by between five and six millions of our people; nor in the work produced by half this number of persons employed in the manufactories and work-shops of the people; nor yet alone in the treasures brought up from the depths of the sea, or borne upon the two oceans which surround us; nor from or upon our grand lakes and large or limited rivers. These are vast, grand and stupendous sources of material wealth and of physical greatness. But, as far above them all as the heavens are from the earth, as a simple question of value, is the general health of the people. Here alone is true manhood, real civilization, the source of contentment in life, peace and rest in the family, pervading happi-

ness and substantial good-will among men. Here alone the personal man is the true temple of the undying soul, and only the purified abodes of men are fitting habitations for this vital principle.

We sum up, in conclusion, the duties of the Federal government and of the State, in the following order:

1. Supervision over the health of the entire people; peaceably if it can be done, forcibly if necessary. Where the Federal government has authority, as upon the sea, lakes, rivers, over forts and arsenals, over the army and navy, in the legislation for commeree, international, inter-State and internal, especially in regard to infected vessels, over animals exported and imported, this authority belongs to Congress. It has been proved, I think, after the most laborious investigations for nearly two centuries past in this country, that the epidemics appearing among us have been traced to importations. If epidemics in this and other gulf cities seem to disprove this fact, the seeming exception is due to the bad sanitary condition of the localities named, or to the fact, as stated by Dr. Vanderpoel, to the germs of disease concealed and dormant in some cellar or room not reached by the purifying air of heaven in the place where the disease exists. The port of New York, for four months of the year, has been as much exposed as New Orleans to yellow fever, and it has been kept away from New York, not by any system of non-intercourse, but simply by the practice of correct principles of quarantine by vigilant and capable officers of the State.

There has been no national interference in New York as in the State of Louisiana, because the State system in New York was and is so complete that the Federal government acknowledges that with us the State system is about as perfect as it possibly can be.

2. State governments are clothed with power over the health of the people within their commonwealths, and over all the territory where the Federal government is without jurisdiction. The colleges and schools of the State, its institutions of charity and learning, its prisons and reformatories, its codes and laws, all that belongs to roads, avenues, parks, canals, docks, piers and even to public and private dwellings, when legislation is needed for health, belongs to the parental care of the State. Epidemics are to be treated like public enemies, and often they are worse than armed foes because more insidious and so often beyond observation. They come in foul sewerage, polluted streams and corrupted wells of water. They come also like a thief in the night and steal away those jewels of the household, the little ones, whose lives are more precious to their owners than all the wealth of the State. To prevent adulterations in food and drugs — not practiced, I hope and believe, to the extent reported or suspected — is another of the State duties. To clothe boards of supervisors and trustees in towns and villages, and mayors, common councils and health boards in cities, not only with ample power in regard to health, but to require them to pass and enforce ordinances, is a positive duty of the State. A State department of health is essential to secure these results, and in its action it must be impartial, effective, vigorous, determined, and take no step backward.

3. While Federal and State governments are bound to do what is here suggested, a higher law or duty rests upon the women of the household and upon faithful men of business. When a woman suggested the first board of health in the State of Massachusetts, the appeal only came when a typhoid fever was discovered in a seminary of learning at Pittsfield. The State cannot secure obedience to law without the sympathy and co-operation of the people. Light and air, cleanliness and order, are the great preservers of health, and the wives, mothers and daughters, as the necessary mistresses of our dwellings, can best serve the State when they secure the greatest possible health in their own homes. Dr. Farr prescribes the right remedy when he says that "health at home is health everywhere," and when he adds, as his conclusion from experience, that "the whole future sanitary movement rests for permanent and executive support on the women of the country." If it be true, as stated by the president of the State Board of Health for Connecticut, that "the predisposing causes of insanity in the United States can be traced to malign influence on childhood," no wonder that we have from Dr. Wilbur, of New York, the startling record that there are 50,000 lunatics in the country, nor that we are behind England, Germany and the age in which we live in our treatment of this class of unfortunate people.

Finally, a word as to quarantine. Commerce cannot be forbidden; but it may be regulated when hurtful to health. At best, however, State law is only a relative guarantee of the public safety, and sanitary instruction, if heeded, is more important than sanitary legislation. Quarantine and commerce are natural enemies, and the State must regulate the relation between the two — the State always insisting that as far as possible the public health, within its borders, shall be permanent. Every nation, and every State, has the right to use intelligent ways and means to preserve health in and over all its borders, and the Federal government also has rights which must be respected, and laws which must be obeyed. There are natural, legal, wise and conservative lines between nations, States, municipalities and towns. Where the death-rate in England is 19.9 in the 1,000, in Austria 31.3, and close on to the latter number in all parts of Italy, and where, as in the United States, four lives in each thousand of people are absolutely wasted, official action is demanded in the name of public safety.

Drawing, then, only the proper lines between nations, States and local authorities as a question of commerce all in established authority may, under the administration of wise laws, be able to say to Congress for all steamers passing between different States, and on all the lakes bordering upon these States, and for the great highways on the ocean touching our American land —

> "Bid harbors open, public ways extend;
> Bid temples worthy of the gods ascend;
> Bid the broad arch the roaring flood contain,
> The mole extended break the roaring main;
> Back to her bounds the subject sea command,
> And roll obedient rivers through the land."

The above paper being referred to the executive committee of the Public Health Association, on the 9th of December, after being read at the morning session of the 10th of December, Dr. Henry B. Baker, from the executive committee, offered the following resolution, which was unanimously adopted by the committee:

Resolved, That 500 copies of the address before this association by Hon. Erastus Brooks, New York, on "What the States Owe to the People," be printed in pamphlet form, and copies be sent to the governors of States, together with a communication, respectfully asking them to consider the propriety of calling the attention of the legislative bodies in their States to the importance of action in the directions indicated in the paper.

AN ABSTRACT OF THE MINUTES AND TRANSACTIONS OF THE BOARD.

First Meeting of the Board.

Albany, *May* 29, 1880,
At the office of the Secretary of State, Albany.

All members present except the Attorney-General and the Superintendent of the State Survey.

A committee of three was appointed to prepare an outline of by-laws and rules for the Board and to report a week subsequently, the Secretary, Mr. Brooks and Mr. Chandler being such committee. It was voted that Dr. Delavan and the Secretary be a committee to prepare a suitable seal for the use of the Board. The Secretary was directed to prepare an epitome of the laws relating to the public health and have the same in readiness at the next meeting of the Board.

Second Meeting of the Board, June 5, held in the Library of the Health Department of the City of New York.

Adjourned Meeting.—A code of by-laws and rules for the government of the business of the Board was adopted. (See Board's By-Laws, pages 6 and 7 of this report.) The following standing committees were appointed:

Executive and Finance Committee.

Hon. Erastus Brooks, *Chairman;* Prof. C. F. Chandler; Dr. E. M. Moore, *President;* Dr. E. Harris, *Secretary.*

Sanitary Committee.

Prof. C. F. Chandler, *Chairman;* Dr. William M. Smith; Dr. E. Moore, *President;* Dr. E. Harris, *Secretary.*

Committee on Registration and Vital Statistics.

Dr. J. S. Delavan, *Chairman;* Dr. J. G. Hunt; Dr. E. M. Moore, *President;* Dr. E. Harris, *Secretary.*

Committee on Sanitary Legislation, Rules and Regulations.

Hon. Attorney-General Ward, *Chairman;* Dr. J. S. Delavan; Dr. E. M. Moore, *President;* Dr. E. Harris, *Secretary.*

Committee on External and Internal Quarantine.

Dr. Wm. M. Smith, *Chairman;* Hon. Erastus Brooks; Dr. E. M. Moore, *President;* Dr. E. Harris, *Secretary.*

Committee on Public Institutions.

Dr. James G. Hunt, *Chairman;* Dr. J. S. Delavan; Dr. E. M. Moore, *President;* Dr. E. Harris, *Secretary.*

Committee on Drainage, Sewerage and Topography.

Prof. James T. Gardener, *Chairman;* Dr. J. G. Hunt; Dr. E. M. Moore, *President;* Dr. E. Harris, *Secretary.*

At this meeting the following resolutions were adopted:

Resolved, That the Sanitary Committee be and is hereby directed to consider the subject of vaccination throughout the State.

Resolved, That the Committee on Registration and Vital Statistics be and is hereby directed to issue a circular to clerks of school districts, and town and county clerks throughout the State, calling their attention to the provisions of chaper 152 of the Laws of 1847.

Resolved, That the Committee on Registration and Vital Statistics be and is hereby directed to prepare the necessary methods and forms for obtaining and preserving records of births, marriages and deaths, and the registration of prevalent diseases, according to section 7 of the law creating this Board.

Resolved, That the Committee on Registration and Vital Statistics be and is hereby directed to prepare the necessary methods, forms and rules for regulating the issue and use of "transfer permits" for the transportation of dead bodies, in accordance with section 7 of the law creating this Board.

Resolved, That the Secretary be and is hereby directed to inform his Excellency the Governor that the State Board of Health has organized and is ready to receive communications from him, in accordance with the provisions of section 8 of chapter 322 of the Laws of 1880.

Resolved, That the Secretary be and is hereby directed to inform all local Boards of Health in the State of the organization of the State Board, and of the time and place of its meetings, to call attention to the provisions of the law, and to request copies of all their reports and publications.

Resolved, That the Executive and Finance Committee be and is directed to report upon the laws of the State so far as they affect the necessary action of this Board, and that it be and is hereby authorized in prosecuting this work to engage the assistance of William P. Prentice, counselor-at-law, and to take into consideration the operation of the health laws and sanitary ordinances of New York and Brooklyn; also to prepare and print such portions of the existing laws as may be necessary for public use and for reference by the Board.

Hon. Mr. Brooks submitted the following resolutions:

Resolved, That the county officers in the several districts of the State, including, in the rural districts especially, boards of supervisors, county, town and village clerks, trustees of villages and the clerks of the common school districts of the State, are hereby requested by the State Board of Health to call attention to the provisions of the law passed May 18, 1880.

Resolved, That in the best interests of the public at large, the State has made it the duty of the State Board of Health, now for the first time authorized by law, to call attention to whatever may secure sanitary improvements by better systems and methods of drainage, sewerage, ventilation, vaccination, the supply of pure water, the prevention of adulteration of foods, and the pollution of wells and other sources of the water supply from cess-pools and other nuisances, and the prevention of filth and diseases, and other destroyers of health and life, to the end that discussion, information, and the best sanitary measures may diminish disease and mortality and save the lives of multitudes of persons now exposed to unnecessary danger.

This series of resolutions was approved and ordered to be published, with the signatures of all the members of the Board.

Third Meeting.

(*A special meeting held in the city of Buffalo, June 30th.*)—In response to a request from the mayor and prominent citizens to meet with a committee of expert civil engineers, viz., Messrs. J. W. Adams, Moses Lane and J. S. Youngs, after a tour of inspection of the canal and sewer out-falls in the southern and western borders of the city of Buffalo, the Board continued its conference with the engineers and citizens.

Upon the motion of State Commissioner Erastus Brooks, the following resolution was adopted:

Resolved, That the city authorities of Buffalo are respectfully requested to communicate to the State Board of Health such facts and information as may be in their possession and as may be laid before them by the health officer of the city and the council of engineers, relating to the sanitary questions upon which this Board has been called to Buffalo.

On motion, it was unanimously voted that the President and Secretary of the Board are authorized to obtain any necessary clerical help at the Central Office of the Board, not to exceed the rate of $80 (eighty dollars) per month, and that they endeavor to arrange this rate with the State Comptroller.

It was ordered that the Secretary be authorized to print for the use of the Board the report on existing health laws of the State, as presented by the Executive and Finance Committee.

On motion, it was unanimously voted that the Sanitary Committee

is authorized to prepare, and the Secretary to circulate a simple plan for the formation of local Boards of Health; also a simple sanitary code in conformity with existing laws, and that in the preparation of such a plan the committee be authorized to consult Mr. William P. Prentice, who is familiar with the State laws relating to public health.

Quarterly Meeting, August 11, held at the Central Office, Albany.

All members present. The Executive Committee presented the report on health laws of the State, which was approved and 3,000 copies ordered to be printed.

A report of the three commissioners who, with his Excellency the Governor, inspected the malarial district at Hart's Falls, Rensselaer county, and all papers relating to the subject were referred to the Committee on Drainage and Topography, and said committee was directed to complete the necessary investigations and report to the Governor whatever was required.

The Secretary of the Board was directed to issue 350 postal schedule cards monthly to facilitate the reporting of mortality and prevalent diseases.

The Secretary was directed to prepare the appropriate register headings for recording births, marriages and deaths, in order to give necessary information to local authorities respecting such registers.

The Committee on Vital Statistics was directed to communicate with all boards of supervisors concerning the laws and means of registration.

Special Meeting, Albany, Sept. 22, held at the Central Office.

All members present. The Committee on Drainage, Sewerage and Topography reported on papers and questions referred to it by the Board from his Excellency the Governor, from Buffalo and from Hart's Falls.

Concerning the questions submitted in regard to the sewage of Buffalo, the Board adopted a report confirmatory of the report by the commission of engineers, recommending a marginal intercepting sewer that shall conduct all the sewage of the city by a conduit along the southern and western margin, parallel with the Hamburg and Main canal, to a point sufficiently northward of the water-supply pumping station to discharge the whole safely into the Niagara river.

The Committee on Drainage, Sewerage and Topography also reported at this meeting the condition and methods of proposed sanitary improvement at Hart's Falls, Rensselaer county. The committee states that it finds that "the people of Hart's Falls are suffering greatly from malarial disease caused by the building of a railroad embankment across the north channel of the Hoosic river

east of the town, and by the construction of the paper-mill dam; and that the only certain and permanent remedy is to be found in thoroughly draining the old channels and covering the surface with dry earth."

The Executive and Finance Committee reported on the vouchers and papers which the Secretary had submitted relating to expenditures. On motion, it was

Resolved, That the State Board of Health, under and pursuant to the provisions of section 7, chapter 322 of the Laws of 1880, hereby adopts the following method and form, and prescribes the following rules regulating the issue and use of transfer permits, with the proper coupons attached thereto, to be issued by local organized Boards of Health, for the transportation of the dead bodies of persons which are to be carried for burial beyond the limits of the counties where the death occurs:

Resolved, That the Secretary be hereby directed to inform all local organized Boards of Health of the adoption of these rules, and to forward to them copies of the form of permit adopted by this Board.*

The Secretary of the Board was directed to prepare a statement, not to exceed one page of note paper, setting forth the purposes of the law establishing the State Board of Health, and calling attention, by references duly marked and numbered, to the special laws and reports printed in the manual of the Board and in the reports of its standing committee, the object being to call the attention of local boards and officers to the provisions of law and the action of the Board for securing the health of the State.†

The standing committees, jointly, on Laws and Vital Statistics, were directed to prepare a draft of a law to secure the uniform registration of births, marriages and deaths throughout the State, in accordance with the provisions of section 7 of chapter 322 of the Laws of 1880.

The Sanitary Committee was directed to prepare a report on offensive trades.

The Attorney-General, as chairman of the Committee on Legislation and Laws, presented for the Board's consideration some of the points in the proposed model ordinances.

It was ordered that reports be prepared by the appropriate standing committees upon the following subjects: small-pox and vaccination; disinfection; diphtheria; dangerous kerosene oil and prevention of accidents therefrom; sale of poison; construction and ventilation of school buildings; the pollution of wells; the proper disposal of house sewage; the construction of cess-pools and the care of manure near dwelling-houses; the drainage of towns and villages.

The Committee on Vital Statistics was authorized and directed to prosecute inquiries into epidemics, as suggested by the Secretary of the Board.

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* See FORMS appended to Secretary's report.
† See No. 10 in catalogue of published documents of the Board.

Last Quarterly Meeting in 1880.

Central Office, Albany, *November* 10.

All members present.

The Attorney-General, as chairman of the committee on laws, reported in accordance with the resolution of last meeting, on proposed sanitary orders, regulations and ordinances for local boards of health, as reported by the committee. The propositions, after reading, were taken up for separate consideration and adopted with various amendments. (See report of Standing Committee on Sanitary Legislation, Rules and Regulations, in a previous chapter of this report.)

At the evening session the Committee on Drainage and Topography reported upon the various propositions that had been examined with reference to the mitigation or removal of the nuisances complained of at Hart's Falls. The action recommended by the Board was communicated to his Excellency, the Governor.

The Standing Committee on Vital Statistics reported on the epidemics and other prevalent diseases, thus far studied, as authorized by the Board. The reports relate to dysentery in Southampton, Babylon and Islip, Long Island; diphtheria in Fulton and Hamilton, Ontario, Chautauqua and Otsego counties; and to fevers, chiefly malarial, in Columbia, Dutchess, Orange and Tioga counties.

On motion, the various reports on diseases were referred back to the Committee on Vital Statistics for preparation for the annual report.

On motion, the several standing committees were directed to have their reports in readiness for the annual report.

It was ordered that the President and Secretary present the annual report to the Governor on or before December 1.

The Secretary submitted a statement relating to the present prevalence of small-pox and the necessity for house-to-house inspection and the public offering of vaccination. It was

Resolved, That this Board urge upon the medical profession in every part of the State the importance of a thorough prevention of small-pox by proper vaccination, and would appeal to physicians to influence families and others under their professional care, to the prompt and faithful compliance with this important duty.

Resolved, That with the design to insure safety to the public health by protection against small-pox, all officers and teachers of schools and seminaries, superintendents and employers of factory operatives and other companies of work people, should advise and secure the effectual vaccination of all persons under their supervision.

Resolved, That it is an imperative duty of the public health authorities in each city, village and township in which there is small-pox, to institute a sanitary visitation from house to house to ascertain where vaccination is neglected, and to advise and make sure of the vaccination of all who are unprotected against the contagion. And further, that in the duties implied and urged in these resolu-

tions, the State Board of Health will do whatever it can to encourage and support the sanitary work.

On motion, it was *resolved*, that a committee of three members of the Board, of which the Attorney-General shall be chairman, be named by the President upon the necessary further legislation deemed proper for the better protection of life and health in the State.

The President appointed as such committee, the Attorney-General, Hon. Erastus Brooks and Prof. Chandler.

On motion of the Secretary it was

Resolved, That the respective Committee on Drainage, Sewerage and Topography and the Sanitary Committee, are hereby requested to act conjointly in prosecuting exact researches concerning wells and other water supplies where such investigations are most important to be made for the purpose of reporting and preventing sources of pollution of water.

On motion of Mr. Brooks, it was

Resolved, That two hundred dollars are hereby appropriated for the necessary uses of said joint committee in procuring the analysis of waters and carrying on said researches.

On motion, the Secretary was requested to prepare an abstract of the proceedings of this Board for publication in the annual report, to present fairly the nature and extent of the work thus far undertaken by the Board, and the action required of the several committees.

The Secretary presented an invitation from the officers of the annual conference of delegates of State Boards of Health, to the New York State Board, to participate in the conference to be held at New Orleans, Dec. 7, 1880, in connection with the Eighth Annual Meeting of the American Public Health Association. On motion, it was

Resolved, That the President of this Board designate two members to be delegates to attend these meetings. The President appointed Mr. Brooks and Dr. Harris.

Special Meeting of the Board, held in New York Nov. 27.

The following standing committees made reports which were referred to the President and Secretary for arrangement in the annual report: the Committee on Registration and Vital Statistics, the Committee on Public Institutions, and the Committee on External and Internal Quarantine.

The various reports by these standing committees were discussed and necessary action taken.

Final recommendations were made concerning the remedies deemed applicable to the causes of malaria and nuisance at the village of Hart's Falls, and the Secretary was directed to transmit a copy of the same to the Governor.

The President and Secretary were directed to complete the First Annual Report and present it to the Governor.

The foregoing is a correct copy of the minutes and transactions (in abstract), as directed by the Board to be made from its records, for the annual report.

ELISHA HARRIS, M. D.
Secretary.

THE SECRETARY'S REPORT.

To Edward M. Moore, M. D.,

President State Board of Health;

Sir: — The duties of the Secretary during the first six months work of the Board having consisted chiefly in the organization and conference required in the preparatory period, it is his duty now to describe the methods rather than the fruit of the Board's operations in this brief period.

Twenty-two States had created their Central or State Board of Health previous to the organization of such a Board in New York. That of Massachusetts having organized in the summer of 1869 as a Board of Inquiry and Advice, the twenty States that followed during the succeeding ten years accepted in general the plan, and to a great extent, the forms of law under which that pioneer Board began its work.

The first duties of these State Boards related to the preventable sources of disease and mortality, and to this end the registration of mortality and its causes engaged attention; but only in a few instances has a State Board of Health found itself clothed with the proper authority to organize such registration or establish a system of vital statistics. Yet with great unanimity they have borne their testimony to the fact that correct and complete records of life and death and of the prevalent diseases are essential to a good sanitary government and to practical hygiene.

The discovery and definition of nuisances and evils dangerous to life and detrimental to health, the improvement of water-supplies, the reform of ventilation of school-rooms and other public buildings, and the instruction of local Boards of Health and the people in regard to ways and means for controlling or stamping out infectious diseases, have chiefly occupied the attention of the older State Boards.

The State of New York presented a somewhat different field from that in other States. There are twenty-four cities, each with a special charter permitting the operation of a municipal sanitary system, and two of these cities, namely, New York and Brooklyn, having elaborate methods of sanitary government. Upwards of three hundred incorporated villages likewise have some provision for a local board of health, while nearly nine hundred and forty towns have for the past thirty years had the privilege of organizing their own local sanitary government. Through the general statutes that prescribe and permit the forms of county government, it has not

only been possible, but has been a well-defined duty of the county, city, town and village authorities, to maintain a Registry of Vital Statistics, the past thirty-three years. In like manner the statute to provide for general vaccination has remained inoperative and impracticable. In this condition of the laws and without any amendment of them, and without any abridgment of the rights and privileges of local government of the towns, villages and cities of the Commonwealth, the State Board of Health has been organized and put in operation under the provisions of the act that created it.

With more than 5,000,000 inhabitants, distributed in 1,300 towns, villages and cities, depending wholly upon their local or community authorities for sanitary protection, the State of New York has provided the organization of a central system for the public care of health, that shall so recognize the wants of all these communities that all shall obtain the largest measure of benefits, while each shall exercise its local authority with the greatest freedom and advantage. Even in the matter of public Registry of Vital Statistics the old doctrine of the primary obligations of local authority and of the communities themselves, remains unrepealed in the several statutes under which this branch of the State Board's duties is now organized.

Plan and Progress of Organization.

Working in conformity to the policy of local government, as defined in the several laws relating to the Public Health and to the Registration of Vital Statistics, it has been our first duty to establish all necessary relations with the local authorities. The duties of the Board's central office, which are under the constant cognizance of the Secretary, are grouped, for the present review, as follows:

1. The establishment of official relations by communications and conference with existing and organizing local boards of health in the State.

2. The communication of such information, requests and incentives to these local authorities as, in their official capacity, should organize and maintain local boards of health where there are, or at the time were, none.

3. The exchange of information and practical suggestions, concerning local duties and sanitary interests, with the proper local authorities, especially those of towns, villages and counties.

4. The systematic daily disposal of official papers and business of the central office of the Board, in accordance with the by-laws and the statutes, and with this view of local duties and local authority.

5. The organization of the methods and system for the registration of births, marriages and deaths, and of the prevalent diseases throughout the State, and the organization of the Central Bureau of Registration and Vital Statistics.

6. The maintenance of correspondence and useful relations with other State Boards of Health and with the National Board.

Under the *first* class of duties, the State Board has issued to every local board of health, and to most of the health officers in the

State, a copy of the Manual of Laws relating to the Public Health and copies of all circulars of information and suggestions, together with the forms and descriptions of methods adopted or advised by the Board.

Under the *second* head, information and important documents and forms have been transmitted, on two or more occasions, to all persons whose duty it is to organize local boards of health, or to perform any part of the duties of collecting and registering the records of births, marriages, and deaths. An enlightened interest rather than indifference has been the usual response.

Under the *third* head the exchange of information has been steadily increasing in its practical importance. Health officers, other physicians, the clerks of school districts, town clerks and supervisors of towns have evinced the greatest interest in their respective duties in regard to the public health. Upward of 14,000 persons, officially concerned, have thus been communicated with by mail; and to most of them various communications have been sent twice, or more.

The daily service of the central office, under the *fourth* head, comprises the duties specified in secs. 5, 6 and 7 of the Act creating the Board. The details of methods which are thus required by the law, and under rules of the Board, are found to be highly important. No errors or confusion will be likely to occur in them. The rules under which the petitions, requests, etc., that are received with the Governor's indorsement for investigation, in accordance with section 8 of chapter 322, Laws of 1880, are immediately referred to an appropriate Standing Committee of theBoard, facilitate the daily dispatch of business of the central office. Other matters, not requiring the interposition of the Governor, are likewise frequently referred either as information or for advice, and a suitable record by the Board.

The organization of the system of Registration of Vital Statistics having been among the first duties to which the Board directed the Secretary to give attention, the methods as agreed upon in the Standing Committee on Vital Statistics have been perfected and the model forms for returns of the individual records have been supplied to the clerks and other officials who are responsibly concerned for such returns and registry of births, marriages, and deaths. The report of the Committee on Vital Statistics exhibits an outline of the work it has approved, and, as the practical duties of registration will begin in many of the towns and villages of the State early in 1881, and date from the 1st of January, the system of Vital Statistics of New York will begin with this year. Depending as it does upon local *ex-officio* registering and collecting clerks, and upon a method of local support for which the county board of supervisors must provide, some counties will fail to make the necessary provision. Consequently the beginning of registration in such exceptional counties will be delayed several months.

In regard to the somewhat complicated, yet obviously economical means, which the Laws of 1880 (chap. 512), and of 1847 (chap. 152),

have provided, the Secretary need not express any apprehensions, though many of the county boards of supervisors may defer their action, or wholly fail to make the provision which the laws designed they should make. The main requirements of the several laws relating to registration are essentially right, namely, that every town and municipality in the State shall have, and provide for, its own local registration of human life and death, and that the necessary cost of performing this duty shall be a public charge upon the property of the people of the county, except as regards cities, which may or may not share the general provision by county authorities. The fact that only six of the twenty-four, cities in this State maintain any thing like complete and correct registration renders it desirable that methods should be adopted to secure complete registry. By adopting the measures that are now to be enforced in the towns, the municipal board of health, or a city registrar, could give full effect to the system, by adopting an effectual method of collecting and canvassing to secure complete records.

The intention of the Legislature to induce adequate preparation of all that is necessary for a perfect system of registration is evinced in section 7 of the act creating the State Board of Health. We here present a few facts to aid in discovering what may be required soon to complete a suitable system of records and vital statistics for the State.

There will always be need of the co-operation of certain local authorities of towns and municipalities to secure complete and accurate records throughout the communities; even if there should be some advantages obtained by having special registering officers responsible only to the State Board or its central bureau designated by it in the towns, cities and villages, there are still greater practical advantages to the people from a system that makes them responsible as well as intelligently interested in securing the universal operation of it in all its details as regards their families, their communities, and the completeness and excellence of the records themselves. Such records concern the welfare of all the families and individuals in each community, and if the State takes advantage of this fact it may, by exercising such authority as will secure the required completeness and perfection of the registry in all places, insure the success of the system of local records and State registration. To attain this desirable result it is obviously necessary, as all experience has shown, that the central office or board which directs and supervises the system of registry, should have power and responsibility entirely adequate to meet and supplement any and all failures and defects in the duty of the local authorities.

The necessity for requiring the interposition of the central or State office to secure the keeping of the records of deaths, births and marriages, need be only temporary in its operation in any town or county, and as the neglect or defects of this work in any community, however remote, must be regarded as a wrong to all other communities in the State, there will ever be a wholesome pressure of public

opinion and influence in favor of universal faithfulness in the duties of registration. It cannot be doubted that these influences and considerations are of much more beneficial effect than any method of fines and penalties to enforce general obedience to, and respect for, such laws as these that deeply concern communities and families in their social and hygienic interests. Thus far the laws have provided for no penalties for personal neglect of the duty required of professional and other persons upon whom rest the obligations to write out and return the individual records of births, marriages and deaths. The practical impossibility of enforcing the application of fines and penalties for such neglect of duty, in the ordinary township and village communities, is obvious. Even in the best governed cities in this State it has not yet been practicable to secure more than a fraction of the records of births and marriages, however rigorously the penalties for neglect to report are enforced. The justice and necessity for such fines and penalties are not questioned, but as these are the least essential of the various agencies which will be necessary in establishing the work of registration of vital statistics in the State of New York, it is not regretted that the provision of law for fines has been thus far omitted.

Certain essential provisions are already made in the three separate laws for registration, which will serve as the foundation of a good and complete system for the vital statistics of the State.

First. The law that created the State Board of Health, in its 7th section, provides and directs that "said Board shall prepare the necessary methods and forms for obtaining and preserving such records, and to insure the faithful registration of the same in the several counties and in the central bureau of vital statistics at the capital of the State."

Second. By the original law for the public registry of births, marriages and deaths (chap. 152 of the Laws of 1847), the duty of all physicians, magistrates, professional midwives and clergymen to report and return a copy of the professional registry by them required to be kept is defined and enjoined in regard to every birth, death, marriage or burial by them, respectively attended professionally. Certain duties of boards of supervisors of counties in regard to providing the material and financial means for the registry in every town are defined in that law, and are left to their discretion as auditors of public expenditures; while in the same act every town clerk and the clerks of school districts in the State are directed to perform certain duties to insure the collecting and local registration of the records of births, marriages and deaths in each town, village and city in the State.

Third. By the Law of 1880 (chap. 512), which defines the obligations and powers of boards of supervisors to provide by ordinance, resolution or regulation for the supervision of burials, the records and registration of all births, deaths and marriages, and to fix the amount and provide for the payment of the registration fees, the duty of

said county boards and of the town clerks are defined and made obligatory ; and this law makes it the duty of the county board of supervisors to furnish the necessary blank books of record, properly lettered, paged, ruled and indexed for this public registry of vital statistics, " the expense of which shall be a proper county charge, to be paid for as a charge in the general expenses of the county."

Thus, under three separate laws, each enacted to secure beneficent results, the registration of births, marriages and deaths is recognized and defined as a public duty. The law relating to the powers and duties of the State Board of Health requires that this Board shall have " the general supervision of the State system of registration of births, marriages and deaths, and also the registration of prevalent diseases," and to this end " to insure the faithful registration," this Board is required by law " to prepare the necessary methods and forms for obtaining and preserving such records." This duty being performed, as the Board now shows that it is, there remains the next following duty which is defined in section 7 of the law creating the Board, in the following terms: " Said Board of Health shall recommend such forms and amendments of law as shall be deemed to be necessary for the thorough organization and registration of vital statistics throughout the State."

In the present report of the Board the Legislature is informed that there will probably be a necessity for some amendment or addition to the laws affecting this subject. Whatever changes may be necessary, the town clerk will undoubtedly be the town Registrar of Vital Statistics, except as it may please the county boards of supervisors and the permanently organized local boards of health in incorporated villages to impose the duty of local registration upon competent Health Officers. No amendment of law is necessary to this discretionary selection. The State Board of Health now has the right to call upon all town clerks and all clerks of school districts to perform their parts respectively in the registry service, and also to invoke the official actions of boards of supervisors to provide for the necessary expenses of the local registration. There is reason to believe that this kind of coördinate responsibility for the local duties of registration will not soon be changed; and if not, then it will be important that the State Board shall be required to prevent such *defects and neglect* of the local service as will occur whenever a county board of supervisors fails to provide for the duties of registration in towns and villages, and wherever registry clerks and professional persons fail to perform their parts in this public service. Such deficiencies in the local service will occur in numerous places, and not unfrequently, until the people in every community become familiar with their duty in regard to these public records of life and death. The best means of temporarily supplementing the services which the State Board of Health may, from time to time, find to be neglected in any county will need to be authorized and provided for by the Legislature. And as such means of temporary interference to cause the local records to be made and registered, will consist in

the instructing and requiring of the communities to perform their duties in this matter, it is believed that only a very moderate expenditure will be found necessary to secure the proposed result. This is the view to be taken now, while there appears to be entire willingness in most of the counties, and by all town clerks and permanently organized boards of health to undertake the local duties of registration. In whatever way the State shall provide that counties and towns shall defray the cost of supplementing such duties as they neglect, the State Board of Health may readily bring into operation the means for securing the attested records and beginning the local registration. The desired completeness and accuracy in these records and the entire system of registration can ultimately be attained through local agencies like those already designated in the present laws; and if, in the progress of improvements in the local boards of health, it shall, at a future time, be best for the towns and villages to have their records of vital statistics registered under the supervision of the sanitary authorities, as will probably be the case, no waste of means and no changes or disuse of the record books and blank forms which are now being supplied to towns, villages and cities, will result. Doubtless the laws and the system will be greatly simplified and improved; but such additional result must be made possible by the best use of existing laws.

In the general effort that is now being put forth in all the States of the Union to secure a thoroughly complete registry of vital statistics, much valuable information is being elicited in regard to the sources and great amount of inaccuracy and incompleteness in the records of life and mortality; and as the want of general information and interest in regard to this class of duties among the people is one of the chief sources of these evils, the steady diffusion of information and of the necessary influence to develop a consciousness of responsibility in the community will continue to be a duty of the State Board of Health. This Board will not appeal in vain to physicians and clergymen to aid in the duties of this undertaking; and, while so appealing to them, and to local authorities who are responsibly concerned, it becomes necessary to see that there are requisite facilities for making up the individual records in suitable forms, and for immediately registering these records as certified or attested. The clergymen and physicians and other professional and official persons who have any share in these responsibilities for the records, have to be supplied with the required forms and instructions for the performance of their respective duties. Fortunately we are now able to report that the printed information and *samples of all required forms* have been distributed in all the towns, villages and school districts in the State, and, with the exception of certain counties that have not yet provided for registration, the towns and villages of the State are being supplied by the county supervisors with all the record books and blank forms required for use in the system of vital statistics. The blank forms appropriate for the respective professional and official persons who are to use them will be distributed by

town and district clerks. The State Board has led in this duty by distributing upwards of *fourteen thousand sets* of these *forms* to the official persons who required such information as these *samples* and the accompanying instructions conveyed. Entire uniformity in all the certificates and other forms, and in the headings and ruling and arrangement of the public registers, is secured by means of electrotyped plates on which the essential parts of them are printed.

There remains to be secured a reasonable uniformity of nomenclature by which the causes of death shall be certified and publicly registered. The necessary steps for securing this desired result are at present being taken by the medical profession in the United States and Great Britain, and to this object the Bureau of Vital Statistics of New York is contributing its share of effort.

The registration of prevalent diseases, as required under section seven of the law creating this Board, will become possible and generally useful as the records of mortality and its causes become accurate and complete throughout the State, and as they will be publicly registered in the Bureau of Vital Statistics at the Capitol of the State. Thus far the few hundred reports that are made monthly to this Board by careful medical observers of prevalent diseases serve to reveal the local rather than any general movements of destructive maladies. But at the beginning of the Board's services, last summer, there were only about twenty cities and villages in the State that kept any public records of death. The laws now require that such records shall be registered in some twelve hundred places.

There will probably be nearly one thousand registering officers engaged in their duties as recorders before the State Board enters upon its second year. Their systematic monthly returns, with more frequent reports if desired, will enable this Board to obtain from medical observers in the same registration districts a useful statement, for the same time, concerning the prevalent and preventable diseases. Reciprocal relations of the State Board with such sanitary observers and so large a number of widely distributed registering clerks are being established with reference to the beginning of a useful system of records of the prevalent diseases; and one of the chief designs of this system is to discover and repress whatever may be preventable in their causation. The two conditions that are requisite to success in the study and recording of epidemic and other prevalent diseases are provided in part by the laws which now require complete registration of mortality and its causes and also require that the local sanitary authorities shall maintain an interchange of information with the State Board of Health. The first instances of the transmission of such information of prevalent disease calling for preventive measures reached the State Board of Health the past season in connection with records of the mortality it was causing. In the first instance the clerk in one of the most distant towns of the State transmitted five attested certificates of death from diphtheria, adding the notice that three of them were from a school district then beginning to suffer from diphtheria of which these were

the first fatal cases, and in the second instance a faithful health officer gave notice of six deaths from one centre that required investigation and immediate action by the State Board. The death records have become the occasion for transmitting most important information of prevalent and preventable disease. The system of monthly returns by which every town and village registering-clerk will transmit all registered certificates of the preceding month provides not only for monthly returns of facts relating to prevalent diseases, but for a postal notice at any date and place where a special report to the State Board should be sent.

Incomplete and fragmentary as such records and scattered information may be, it will become the basis of most useful knowledge. The medical profession asks for, and is contributing, it. The State has important uses for it, and the local sanitary authorities need it and whatever conclusions may be derived from the systematic study of the accumulated observations from all quarters.

To recapitulate the points that concern the people and the State Board of Health in the matter of registration and vital statistics, we find:

(1.) That the several laws relating to them are based upon the fact that the State has a central use and responsibility for complete records of births, marriages and deaths, and therefore requires that these records be kept and furnished by local authorities.

(2.) That none of the local-government authorities, except the municipal Boards of Health in a few of the cities, have until now, as requested by the State Board of Health, attempted to provide ways and means for maintaining the duties of registration.

(3.) That because these duties require an intimate personal acquaintance of each registering and collecting clerk, in and for his district, and also must have the prompt co-operation of all householders and professional attendants who witness and certify the events to be recorded, it is better to accept and test the provisions of existing laws that are based upon such facts, and the responsibility and obligation of the local government in the towns and counties, villages and cities, than to discredit these laws and seek to create a more centralized and independent system. Yet, in order to prevent the defeat and failure of the chief purposes of registration as respects completeness, accuracy and the rights of all inhabitants, it is necessary that the State should enforce and secure the required completeness and accuracy; and that whatever supplementary work of this kind may be required of the State Board of Health may be only temporary and that it should be instructional, to the end that it shall be only temporary; also that, though chargeable to the counties and towns or municipalities for which performed, it should, as far as possible, employ the agencies already designated by the laws so as to prepare them fully for the duties contemplated in the laws as we find them.

(4.) The preparation of the methods and forms and the superintendence of the State system of registration and vital statistics, as now required of the State Board of Health are already so well approved

in the towns and counties that there will be no great difficulty in giving such practical effect to the supplementary work to make the registry complete, that in every county and town the clerical duties may be voluntarily maintained, after a year or two. Until so assumed voluntarily, the cost chargeable to towns and counties that fail to take action to provide should be kept at the lowest minimum that will maintain the duties. The statements annexed (marked A, B, C and D) show what the average cost of registration is in counties that have begun ; also, what the regulations and methods are in those counties.

(5.) The further adaptation of the laws to secure the efficiency of the system, as required by the 7th section of the law creating the State Board, need not, in any way, impair the beginnings or throw out of use any of the record books and blank forms which the counties, towns, villages and cities have ordered in conformity with the laws of 1880. The local registry will continue, whether the town and village clerks, or the local Health Officers, be the registrars. In certain counties the supervisors have already assigned the duty of village registration to the Health Boards. After a fair experiment, thus voluntarily made, the result will show what change may be necessary in regard to registering clerks ; but it is known, from the first, that the records of mortality ought to be locally supervised by the public health authorities, wherever permanently organized. This is already being done in a few townships.

(6.) Entire uniformity in all methods and official forms prepared by the State Bureau of Vital Statistics is already secured, and this Bureau is co-operating with the proper officers in the other States of the Union to secure the greatest practicable uniformity throughout the United States. Especially is this effort now urged with reference to a correct and reasonable uniform nomenclature attestation of the causes of death.

(7.) The systematic observation and recording of prevalent and preventable diseases is beginning to be possible. This useful kind of daily renewed information will increase in quantity and value just in proportion to the completeness and accuracy of mortality records and to the efficiency of sanitary officers throughout the State.

Thus far, the State Board of Health has organized and set in motion the system of registration and vital statistics, and if this system seems to be complicated, it is because numerous laws relating to the matter — and all in operation — have to be co-ordinated so as to secure the action of local authorities as well as insure an efficient supervision and complete records at the State Bureau of Registry. At this center must be compared and usefully studied the accumulated records from all parts of the State. These records comprise simply the original certificates of birth, marriage and death, as attested and registered in the several local offices of town clerks and Boards of Health, and transmitted monthly, together with the other current reports and information relating to prevalent diseases.

To this information we add whatever may be learned of the results of sanitary improvements and the conditions which favor the public

health and secure immunity from epidemics and preventable diseases. By this ceaseless survey, description, comparison and mapping of the courses of disease and the varying rates and causes of mortality in more than a thousand registration districts, the whole State will derive practical results far more useful than any merely numeral summaries that would only record the total losses by death and the gains by birth and the establishment of families by marriage. The purpose to render this branch of work directly tributary to public health interests is well formed and now seems attainable. The State Board of Health has recognized the practical relations of this branch of its work, as defined by a sanitary statesman of England, who has emphasized his estimation of it by saying: "Considered physically, the main object of correct civil registration of births, deaths and marriages, is to aid in *disclosing the causes of disease.* Considered legally, the object is to provide the means of tracing descent and proving personal identity. And considered politically, it is to assist the government in arriving at correct conclusions in regard to measures of internal economy, etc." Completeness, accuracy and the requisite attestation of such records should be fully attained under the system of vital statistics in the State of New York.

Relations with the National and the State Boards of Health.

The National Board of Health, now in the second year of its work, is exerting a beneficial influence to induce the adoption of correct principles and methods of sanitary procedure against infectious and pestilent diseases, to prevent their dissemination or propagation. Its efforts are also now well directed toward the establishment of uniform and efficient State Registry of Vital Statistics. The several State Boards of Health are giving special attention to these duties, as well as to other objects for which they exist. Useful consultations and correspondence upon these matters are in progress between these Boards.

Sanitary Inquiry and Organization of Investigation.

The current correspondence and official intercourse of the Board have started numerous lines of sanitary inquiry, particularly those which relate to the precise nature and limits of localized sources of prevalent diseases, the sanitary topography and present condition of malarial districts; the neglect of vaccination; the uncontrolled dissemination of small-pox, diphtheria and scarlatina; the endemic and specific causes of fevers; the defilement of domestic water-supplies, and, most of all, the devising of preventive sanitary measures and the consultation with local authorities respecting the application of them.

In the organization of sanitary investigations, as in the constant inquiries which are in progress on public health questions, the correspondence and intercourse that have been established with local

authorities, and the physicians and engineers who advise with them, supply much information and aid. The several brief reports here appended serve to illustrate this relation of local helpers and informers in the practical working of this Board. Useful as such intercourse and correspondence with the Board has been in the inception of its work, the more comprehensive investigations upon which the Board has begun to enter, and which must be reported hereafter, will exhibit striking evidence of the utility of these reciprocal relations. Every member of this Board has, in the work of committees or otherwise, engaged actively in the duties which required his counsel.

Thus far it has been noticeable that the requests and complaints which this Board has received or had referred to it have been about equally distributed between questions involving the interpretation and application of health laws, the knowledge and best experience of topographical and sanitary engineering, and a precise knowledge of preventable diseases, their causes and the sanitary measures they require. Judging from the total experience for six months, it appears evident that the Board has done wisely in the issuing of its carefully prepared compends of the public health laws, the briefs of information and all the sample forms that are necessary for the clear understanding of what the laws now require and provide, and what are to be the methods of the Board, and what the powers and duties of local officials who are now in relations with this Board. In this least noticed but very essential preliminary work now completed in the office of the Secretary of the Board, upwards of 450,000 pages of printed matter, carefully prepared under the Board's direction, and after its discussion and revision, have been issued to nearly 20,000 persons. The organization of local duties and the beginning of the Board's permanent work have thus been based upon information and coördinated efforts in which every town and school district, and every incorporated village and city, in the State, has its own share.

Respectfully,

ELISHA HARRIS,
Secretary.

REPORTS UPON PREVALENT DISEASES,

BY THE SECRETARY.

Records of Diphtheria in 1880.

The epidemic prevalence of diphtheria in the village of Geneva had become known throughout the State before this Board was organized. The records of that epidemic, as contributed by the village health officer, are so instructive that they will be given in this chapter. Late in the past summer this malady was reported to the State Board from a few districts widely separated and presenting good opportunities for observing the conditions under which it was being spread from house to house and place to place. We here present the more important of the records obtained previous to December.

The epidemic in the village of Geneva revealed certain local conditions that unquestionably had a large share in propagating and perpetuating the infection of the disease. The accompanying chart of grounds upon which it prevailed conveys useful suggestions.

The outbreaks of diphtheria in various highland regions like those of Chautauqua, Otsego, Fulton and Hamilton counties, have been investigated, and are here briefly recounted for the practical lessons they teach. Whatever has been the origin or the first cause of the malady in any place, there appears to be no doubt of the fact that by means of its own infective attribute it has been rapidly spread along the lines of domestic and personal communication, aided in numerous instances by the fertilizing and localizing agencies of polluted wells and foulness of dwelling-grounds, and yet, in numerous other cases, invading the most salubrious homesteads and attacking the most promising lives. This lesson, especially, if not more, is taught by the events that are here briefly recounted.

Diphtheria in Hamilton and Fulton Counties.

The occurrence of diphtheria in an isolated and wilderness region in the township of Arietta, early in the autumn, furnished an opportunity for unusually exact observations upon the origin and discernible causes of this disease in a district where, as it is believed, no case of it had ever before been seen. Though the Secretary of the Board found in the first duty he owed to the inhabitants of that region the urgent necessity for organizing a provisional sanitary service for them, two physicians in Fulton county voluntarily became the helpers of the State Board of Health in this service.

We here condense the record of observations relating to diphtheria in that southern border of the North Woods. The first information was from the health officer of Gloversville:

"GLOVERSVILLE, N. Y., *Sept.* 21, 1880.

"*To the Secretary State Board of Health:*

"DEAR SIR — I have to-day promised to call the attention of the State Board of Health to the fact that an epidemic of what has proved to be quite malignant diphtheria, now prevails in Arietta, Hamilton county, about twenty miles north from this place. There have been so far six deaths in about ten days. About eighteen persons are now sick. None have entirely recovered. Some are getting better. * * * * * Any attention which the State Board of Health may give to the case will be gratefully received."

(Signed) "EUGENE BEACH, M. D.,
"*Health Officer, Gloversville.*"

"GLOVERSVILLE, N. Y., *Sept.* 24, 1880.

"DEAR SIR — Yours of yesterday received. * * * I would say that I will make arrangements to accompany you to Arietta, and will undertake to study the history of the epidemic as thoroughly as I can, provided it should not necessitate my going to Arietta except once. We could have the whole day for forty miles of riding and necessary investigations. The cases should be examined while the epidemic is at its height, and the sooner the better.

"There is no physician at Arietta. Dr. John E. Burdick, of Rockwood, a hamlet in Fulton county, has some knowledge of the cases. He is fifteen miles distant from the place. No other physicians are nearer than Gloversville.

(Signed) "Truly yours,
"EUGENE BEACH."

Having visited the region above mentioned, in company with the Health Officer of Gloversville, it became one of the first duties to communicate with the supervisor of the township, though he resided some twenty miles away from the afflicted neighborhood, to urge him to bring into action whatever means he and the justices of the peace of that wilderness town would need to exercise for the sanitary protection of this scattered population. The superintendent and agent of the forest property, Mr. Plaisted, had already promised, in an interview, such aid as he could render.

A memorandum for sanitary instruction and aid of the people of Arietta was immediately printed and distributed as widely as possible. This memorandum will be found, at the close of these records of diphtheria, in connection with further correspondence with the physicians who generously lent their assistance.

Dr. BEACH'S REPORT.

To Elisha Harris, M. D., *Secretary State Board of Health:*

Concerning the outbreak of diphtheria in Arietta, I have the honor to report that, by your request, and to assist the State Board of Health, I have visited the locality on three different occasions. The first was made in company with yourself on September 26, the second on October 3, and the third on October 19, 1880. The conditions were found as follows:

The Locality.

The region in which the outbreak occurred is on the south-western branch of the Sacandaga river, otherwise named the South Branch of Piseco river, in the township of Arietta, Hamilton county, lots (half-mile square) 24, 25, 90, 143 and 39; these lots constituting an irregular parallelogram that is bisected by a curved river-course which makes westward and turns abruptly northward. The straggling little hamlet is built along the forest road that crosses the river, and the few dwellings that are built away from that road are duly marked upon the accompanying map, as all the other houses are.

This region is in latitude 43° 16′ and longitude 2° 25′ E. Altitude about 1,500 feet.

The Population. Census of Families and Record of Cases.

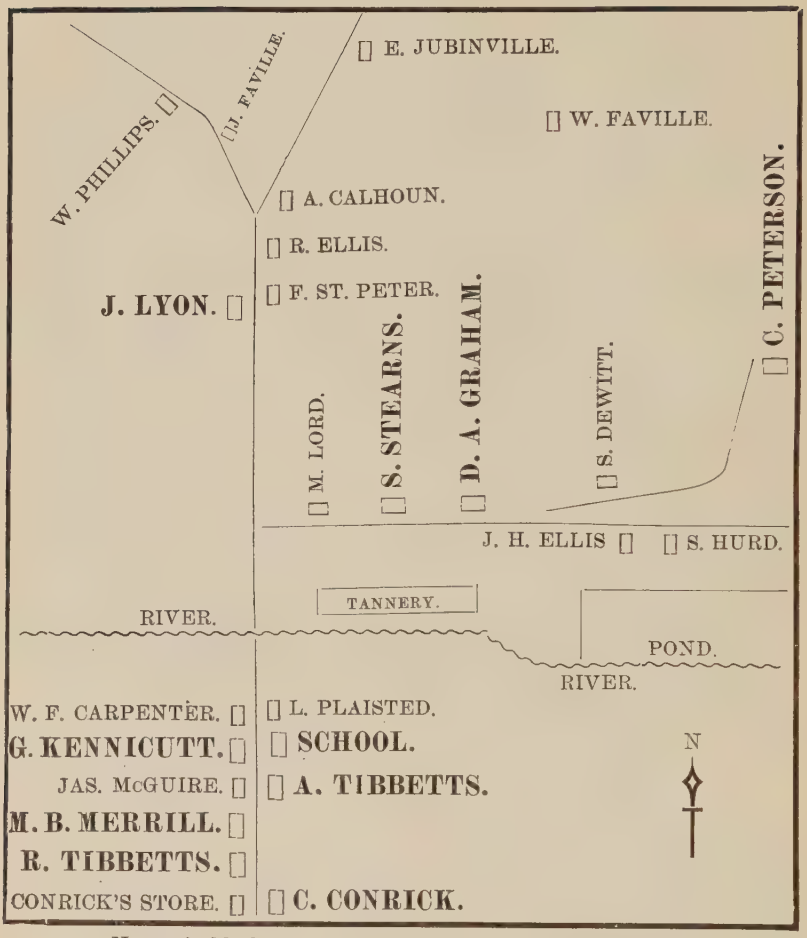
Total number of families 33. Total inhabitants at outbreak of the disease, 153, distributed as follows:

(*a*) *Families attacked up to October* 19.

Family of	Total No. of person's family.	No. of children.	Total cases of diphtheria.	Deaths prior to Oct. 19.
Mr. Kenicutt	4	2	3	..
Mr. Stearns	8	6	6	3
Mr. Lyons	8	6	2	..
Mr. Graham	5	3	3	1
Mr. Merrill	6	4	6	..
Mr. R. Tibbetts	4	2	2	2
Mr. Conrick	4	2	2	1
Mr. A. Tibbetts	11	7	9	..
Mr. Peterson	4	2	2	..
Mr. Bonnville	6	4	2	..
Mr. Near	4	2	2	..
Mr. Mosher	4	2	1	..
Mr. Van Hooser*	11	3	3	3
Totals	79	45	43	10

*Third child died in Northville, October 22.

Hamlet of Arietta.



Names in black type indicate families that had diphtheria.

(*b*) *Families that have not been attacked up to Oct.* 19.

Family of	Total in family.	No. of children.
Mr. McGuire	2	..
Mr. DeWitt	6	4
Mr. Calhoun	6	4
Mr. Ellis	5	3
Mr. St. Peter	3	1
Mr. W. Favil	3	1
Mr. J. Favil	2	..

Family of	Total in family.	No. of children.
Mr. Carpenter	2	..
Mr. Plaisted	2	..
Mr. Hurd	6	4
Mr. Phillips	5	3
Mr. Failing	2	..
Mr. Ellis	5	2
Mr. Lord	2	..
Mr. Jubenville	3	1
Mr. McCoy	4	2
Mr. Devine	4	2
Mr. Keneil	2	..
Mr. Leavenworth	5	3
Mr. Spencer	5	3

Record of Cases.

The Kennicut family — Mrs. Kennicut with her two children, Frank and Arthur, returned June 26th from Johnstown, where they had visited a family, ("the Dueslers") and passed the night, sleeping together in the same room, and in the same bed in which a little child of Mrs. Duesler's had died June 8th (other cases had previously occurred in the Duesler house.)*

Frank, aged 8 years, was in Sunday School in the school-house on Sunday, June 27th. He was taken sick June 28th and was very sick for a few days. He made a fair recovery. Arthur J., aged 4, slept with his brother, was violently attacked and was sick three weeks. Mrs. Kennicutt, aged 30, was attacked violently July 7th and was sick three weeks. She made a good recovery.

Thirteen cases, at least, occurred since July, 1879, in this house, the next, and the one opposite, and nine other cases in the immediate neighborhood since May, 1878.

The Lyons family: — Frank Lyons, aged 8 years, was attacked August 29th very severely. He was ill all the day in school, and was allowed to lie down upon a bench. He became delirious; is now, September 26th, anæmic and tremulous. Mary, aged 6 years, was attacked September 16th, and is now doing well.

The Stearns family — Joseph Stearns, aged 5 years, spent the greater part of August in Rockwood, at his grandfather's, fearing to come home because his cousins, the Kenicutts, were sick. His mother is sister of Mrs. Duesler, in Johnstown, who lost a child June 8th, and at whose house Mrs. Kenicutt visited June 25th and 26th. Mary Shaw, an unmarried sister of Mrs. Stearns and of Mrs. Duesler, then living at Duesler's in Johnstown, came up to the grandfather's, and may have brought other articles of clothing from the deceased Duesler child, but confesses to the bringing of shoes worn until the Duesler child took her death-bed. Those shoes were actu-

*See map of Johnstown in a subsequent section of this report.

ally on the feet of the child who was found convalescent in the Stearns family September 26th.

Mrs. Duesler, with her two children, visited at her father's (Mr. Shaw's) in August, while the Stearns children were there, and stayed a week. She came there August 8th and remained until August 13th.

Joseph Stearns, aged 5 years, was sharply attacked August 30th, thirty-six hours after arriving in Arietta from his grandfather's. The Stearns and Kenicutt families live widely apart, on different sides of the river and on different roads.

James, aged 7 years, attacked August 31st, and died September 12th.

Homer, aged 4 years, was attacked September 3d.

Ralph, aged 2 years, attacked September 8th, died September 11th.

Margaret, aged 11 years, attacked September 8th, died September 18th.

Claude, aged 1 year, attacked September 19th, is still weak.

Three persons were found in various dwellings who seemed to have taken the disease while attending upon the sick in the Stearns family, especially the two men, Colby and Phillips, who reside at Mr. A. Tibbetts' crowded house.

The deep sympathy that is felt for this family, which had expressed great fear and dread of diphtheria, has already led to serious consequences. It appeared, in this connection, that each of the dead children was watched over by "corpse-watchers" at night until buried, and that every one of the six funerals in the district was a public funeral. Also, that the common school was fully attended during the period of greatest danger to the children, and that one pupil (the Lyons boy) had remained in the school room, reclining on one of the benches, all day, *very sick*. The school-house is situated directly opposite, across the roadway from the Kenicutt house. But the Stearns family, more than others, avoided all other children and every family in which there was any sickness. In this connection the facts show two certain sources of the malady to which the Stearns children were exposed, as well as a surmised source not proven. In the first place, they were exposed to the infected clothing and person of their aunt, Mary, who resided with the Dueslers in Johnstown, and was back and forth to her father's, twice at least, while the Stearns children were there. Secondly, they were exposed to the infected clothing and persons of Mrs. Duesler and her two children who visited at her father's a week during the same period. Finally, it is possible, but not proven, that they were exposed to infected clothing other than the shoes worn by the Duesler child which died.

The Peterson family — The Petersons, residing nearly one-half mile east of the Stearns family, in a sequestered place near the tannery pond, consist of the parents, a son (Cyrus) aged 30, sick September 26th, now recovered, and a daughter aged 17, taken sick September 5th, sick but a few days, who since went to visit the family of Mr. M. Wilkins in Perth. Up to the present time I have

been unable to learn that this visit has been followed by any resulting sickness. This family *gave much attention to the sick during August.*

It is a fact to be noted that two families nearest Mr. Peterson's log-house and close to the now dry pond, but remote from other families of children, from the school-house and from the most afflicted families, have suffered no attack. The unhygienic condition of the premises and dwelling-sites of these two excepted families is a fact of much significance. These and the next two to be mentioned are more exposed than any others in the district to what is known as "fleshings" and waste from the tanneries.

As the disease began in the Peterson hut, September 1st, its presence as a general atmospheric poison would have invaded these dwellings by the side of the pond, were such a virus generally diffused in the atmosphere.

The Graham family — Frank, aged 9 years, while attending school with the Lyons and Kenicutt children was attacked September 4th. He has recovered but is anæmic and feeble.

Anetta, aged 4 years, was attacked September 12th and died September 20th. She had mingled freely with the school children and was constantly in the presence of her brother who was sick.

Frederick, aged 1 year 6 months, was taken September 15th and has recovered. The parents have not been sick. The dwelling is on high ground considerably elevated above the houses last mentioned, but it is the nearest to them.

No sickness has occurred in the boarding-house (Mrs. Lord's), which is next to the residence of the Stearns family.

The Merrill family — This family lives on the south side of the river, three-fourths of a mile south from the pond and the Peterson family.

George, aged 10 years, was attacked September 3d; recovered.

Edward, aged 4 years, was attacked September 5th; recovered.

Una, aged 6 years, was attacked September 5th; recovered.

Mrs. Merrill, aged 30 years was attacked September 11th; recovered.

Mr. Merrill, aged 30 years, was attacked September 25th; recovered.

Mr. Alfred Tibbetts' family —This family occupies a very crowded house, partly of logs and only one story high. It is near the school-house, on the same level and on the same side of the road, and was inhabited, when sickness began, by twelve persons. Colby and Phillips, young men, were the first to suffer, and may have been the carriers of infection, as they were much with the sick in all the families. They have recovered. The members of this family who were sick at the time of our visits, were,

Forest, aged 4 years, attacked September 10th; recovered.

Nettie, aged 6 years, attacked September 12th; recovered.

Harriet, aged 11 years, attacked September 12th; recovered.

Frank, aged 9 years, attacked September 15th; recovered.

William, aged 2 years, attacked September 16th; recovered.

Eldest daughter, aged 19 years, attacked September 20th; recovered.

Mr. Roswell Tibbetts' family — This family lives a quarter of a mile south and on the opposite side of the road from Mr. Alfred Tibbetts. There were two children, Edward, aged 13, attacked September 14th, died September 19th; Charles, aged 11 years, attacked September 4th, died October 3d.

The Conrick family — This family lives next south from A. Tibbetts on the same side of the road but nearly half a mile south, in a new and very good house. There were two children; one died about September 15th, whereupon the family fled with the remaining child to Troy where that child also had diphtheria and recovered, but is now anæmic.

Mr. Conrick, on arriving at Gloversville, reported to me the condition at Arietta, which was the means of leading to this investigation.

The Bonville family — This family lives four miles down the river, north from the starting-point of the disease. There are four children in the family. All were sick at the time of our first visit in Arietta and all have recovered.

The Near family — This family lives in the same yard with the Bonvilles. Two children, who have been sick, have recovered.

The Mosher family — The family of Mr. Mosher lives in a log hut on the east side of Upper Stink lake, one mile south of Arietta tannery, and three-fourths of a mile from any other dwelling. There are two children: Henry, aged 8 years; taken sick October 1; recovered. Andrew, aged 12 years, not sick. Mrs. Mosher and her husband both assisted in caring for the sick at R. Tibbetts'. Mrs. Mosher was there every day until Thursday, September 30. She also *took to her home*, a mile away, *the washing from Mr. Conrick's* after their child died. She finished that task in her own house, on Tuesday, September 28.

The Van Hooser family — Mr. Van Hooser conducted a "lumber shanty" in the woods, at Clock Mill lake, eight miles north and down the river from the tannery. He had three children, viz.:

Avis, aged 9 years, attacked October 4, died October 6.

John, aged 4 years, attacked October 9, died October 13.

Georgie, aged 19 months, attacked October 9, died October 22.

Father, attacked October 11, recovered.

Mother, attacked October 11, recovered.

Upon the death of Avis, Mr. Van Hooser moved the rest of the family out to Northville, *carrying the corpse*. But the infection went with them and attacked all of them, killing John and Georgie. The infection was undoubtedly carried to this family by Michael Flynn, who was among the sick at Arietta, and sat up with the dead as corpse watcher, and returned to the lumber shanty, eight miles away. The following note from a resident of the place confirms this point:

"ARIETTA, *Nov.* 5, 1880.

"DEAR SIR — I have been inquiring in regard to the whereabouts of Michael Flynn the week prior to the sickness of Van Hooser's child, and find that he was here a few days before, and especially the night before he returned to the Van Hooser's shanty *he sat up with one of Roswell Tibbetts' boys* that died.

(Signed) Yours,
W. F. CARPENTER."

FIRST CASES AND GROUPS.

The eldest Kenicutt boy was infected in Johnstown. His mother and younger brother, as shown in the sequence of events, took the disease in their home, doubtless from the sick boy.

The school-house, directly opposite their home, and only fifty or sixty yards off, may have been the next point reached by the cause thus centralized in this family. It has been already shown that these boys attended Sunday school in the school-house the day before the first was known to be seriously sick, and when convalescent, the boys again entered school. The Lyons, the Graham and the Merrill children had ample opportunity to become infected by this personal and domestic cause at the school-room. They began to develop the disease the last week in August, and after the Kenicutt boys had returned to school during their convalescence.

The Stearns family seems to have proved their separate dependence upon a peculiar and unsuspected source of infection as already mentioned; but in turn this most unfortunate of all the families has been the center from which the infection has spread as fatally as that which seems to have issued from the school-room.

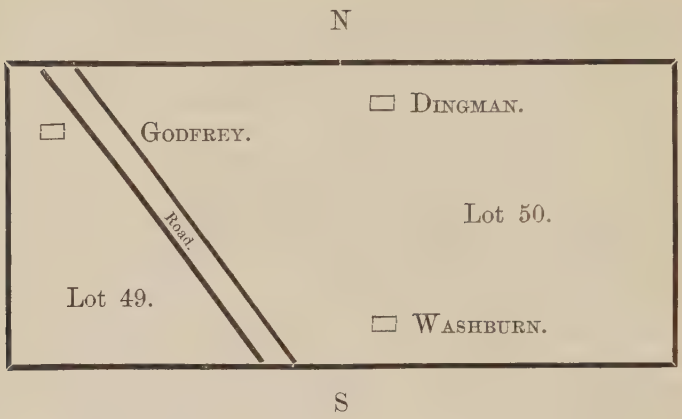
All the families residing in the cluster near the tannery have manifested a great interest in disinfecting, which they have very thoroughly done, even to the removing of wall paper, the burning of window shades, and the renewed whitening of the plastered walls.

For the facts concerning diphtheria in Arietta, and for assistance in apparently suppressing the disease in that locality, I am largely indebted to the kind and prompt coöperation of Mr. L. Plaisted, superintendent of the tannery; and to Mr. W. F. Carpenter, an assistant postmaster who has charge of the mails in that region of Arietta; and especially to John Burdick, M. D., of Rockwood, who has emphasized all recommendations made by the State Board of Health and myself on its behalf.

DIPHTHERIA IN THE TOWN OF BENSON.

Location — The middle of the three southern towns of Hamilton county, which is called Upper Benson, is a straggling hamlet lying in lots 11, 12, 50, 49, one and one-half mile square, along a country road not far from a mountain stream running southward and eastward to empty into the Sacandaga near Northville. The region is high

and well drained. It is called Upper Benson because it is up the stream from a hamlet nearer Northville called Lower Benson.



Families Afflicted.

Family of.	No. persons in family.	No. of cases.	Date of cases.	No. of deaths.	Date of deaths.
Mr. T. Godfrey...	6	3	Oct. 7–29	3	Oct. 9 to 29
Mr. E. Washburn.	6	2	First case Oct. 11	..	.....
Mr. — Dingman..	6	5	First case Oct. 20	..	.....
Total.....	18	10	.....	3	.....

Thomas Godfrey's family was the first to suffer and that most severely, as there were three children killed by the disease, all in twenty days.

The connection with a sick family in Arietta. — Mr. Godfrey is brother to Mrs. M. B. Merrill of Arietta. The mother of Mr. Godfrey and of Mrs. Merrill assisted in the care of the sick in Mr. Merrill's family in Arietta, and afterward returned to her home with her son, Mr. Godfrey, in Benson. Soon after her return her grand-children, the Godfreys, were taken sick and, as above stated, all died. I have so far been unable to learn the exact date of Mrs. Godfrey's return, but it will be noted that the last case in the Merrill family began September 25, and the first in the Godfrey family commenced Octo-

ber 7, giving a period of twelve days for Mr. Merrill to have recovered and the first child at Godfrey's to have become infected. The Godfreys had public funerals at their dwelling.

Mrs. Washburn assisted in the care of the Godfrey children. The next to be attacked was a Dingman girl, aged 13 years, residing in the Washburn family. She was convalescent October 29. The next case was that of Miss Jordan, the school teacher, who resides in the Washburn family. She also was convalescent October 29.

Mrs. Dingman attended funerals at Godfrey's. She also assisted in the care of her daughter who was sick at Washburn's. The first case at Dingman's began October 20; there were five cases, and, October 29, all were convalescent.

For the facts concerning the outbreak in Benson up to the present time, I am indebted to Dr. J. A. Avery, of Northville, who had charge of the cases.

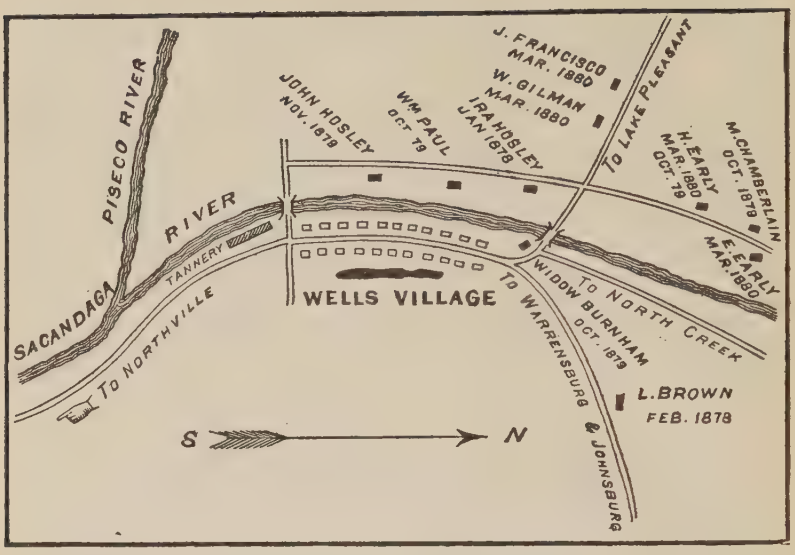
Diphtheria in the Town of Wells.

The town of Wells is the second, toward the north, of the four towns which compose the eastern tier of Hamilton county. The village of Wells is in the southern part of the town, mostly on the east bank of the Sacandaga river, in latitude about 43° 21′ N., and longitude about 2° 43′ E. The altitude of this region is about 1,200 feet above tide, well drained and dry. On either side of the river, half a mile distant from the banks, irregular mountains rise to the height of several hundred feet.

The first case appeared, January 1, 1878, in the family of Ira Hosley. Next, about the 5th of April, the family of L. Brown had diphtheria. About the same time a single man, by name Merrill, had the disease. These compose the first group.

To the origin of this first group I was unable to find but one clue, namely, infection from the teacher, Miss Mary Bass, of Hope Falls. By visiting the house of George Bass, at Hope Falls, of whose family Mary Bass is a member — George Bass being her brother — I learned that, in November, 1877, the whole family, consisting of five persons, father, mother, two children and sister Mary, had diphtheria. Mary Bass was sick about Thanksgiving time. She commenced teaching in Wells about December 1. At that time she had not fully recovered, her throat being yet "tied up."

Ira Hosley's children, the first to suffer, attended school. The children of L. Brown are cousins to Mary Bass; they attended school and the teacher visited at their house. About the same time Mr. Merrill, a single man residing in Wells, had diphtheria. I have no means of knowing how he came by it; he may have been among the sick.



Second group. Seventeen months later diphtheria again made its appearance. The first case was in the person of widow Burnham. It was next seen in the family of John Hosley, September 17, 1879. Soon afterward a boy named Herrington, in the family of Wm. Paul, had the disease and died. This was about the first of November, 1879. At about the same time his brother had the disease at H. Early's.

Then followed an interval of about four months, which brings the date to March, 1880, when Mrs. Martin Chamberlain and her child had diphtheria and the child died. It then appeared in the families of Wallace Gilman, J. Francisco, E. Early and H. Early.

Origin. — I am unable to account for the sickness of the widow Burnham by any facts in my possession, provided the date given is correct, unless it should be in the fact that the teacher, Miss Bass, boarded with her in 1878, more than a year before. The women of John Hosley's family, which appears next in the list, called upon Mrs. Burnham during her sickness, and eight of the family had diphtheria in September, 1879. The next family appearing in the list is that of H. Early, in which one of the Herrington boys resided. Mrs. Herrington, the mother of the boys, died of diphtheria, in Johnsburg, in October, 1879, and the body was brought to Wells for burial. One of the boys was taken into the family of Wm. Paul where he died of diphtheria early in November, as before stated. The body of Mrs. Herrington, awaiting burial, and the other boy were taken to H. Early's where the boy had diphtheria and recovered. After this case there appears to have been an interval of about four months before the next case, and this occurred in the family of M. Chamberlain. Chamberlain lives neighbor to H. Early,

and H. Early is grandfather to the Chamberlain children. One child died. Elijah Early is son of H. Early and brother of Mrs. M. Chamberlain; he assisted in the care of Chamberlain's family and was one of the next to have the disease. Mrs. Wallace Gilman sat up as corpse-watcher with the body of Chamberlain's dead child. Her children were attacked soon after and one died. One of Gilman's children went home sick from Jacob Francisco's, and Francisco's child was taken with diphtheria soon after. Mrs. H. Early assisted in the care of her son, E. Early, and her daughter, Mrs. M. Chamberlain, and had diphtheria soon after.

Thus it will be seen that there were two separate sources of infection to Wells, and two distinct groups. The first group was undoubtedly due to infection from the teacher, and the second to the corpse of Mrs. Herrington and to her children.

I am indebted for the greater part of this information to the kindness of Dr. Thomas McGan, of Wells. There may be, and there apparently are, some discrepancies in dates, which the lapse of time prevents correcting, but the facts, I am sure, are substantially as narrated.

It may be proper to state before leaving this part of the report that Dr. McGan gave me an account of certain sporadic cases, miles away in different localities, having no apparent relation to these cases at Wells, which I have not thought best to include in this report.

I will, however, as it is significant, say that he reports one case, which appeared in the person of a single man, some five or six weeks since, on Piseco river, seven miles from Wells. This is on the direct route from Arietta to Wells.

Family of	No. persons in family.	No. cases in family.	Date of cases.	Deaths.
Mr. I. Hosley.....	5	3	Jan. 1 to 10, 1878.	1
Mr. L. Brown.....	9	5	April 5, 1878.	..
Mr. Merrill	1	1	April 5, 1878.	..
Mrs. Burnham.....	1	1	Aug. 20, 1879.	..
Mr. J. Hosley.....	8	8	Sept. 17, 1879.	..
Mr. Wm. Paul.....	4	1	Nov. 2, 1879.	1
Mr. H. Early.....	3	1	Nov. 2, 1879.	..
Mr. M. Chamberlain..	4	2	March 25, 1880.	1
Mr. E. Early.....	3	1	April 4, 1880.	..
Mr. W. Gilman.....	5	3	April 4, 1880.	1
Mr. J. Francisco	3	1	April 4, 1880.	..
Mr. H. Early.....	3	1	April 4, 1880.	..

Diphtheria in Johnstown, Fulton County.

Johnstown village in Fulton county, four miles north of the Mohawk, in latitude 43° north, and longitude 2° 30′ east, at an elevation of about 500 feet above tide-level, has a population of 5,247. The

Cayadutta creek runs through the village from north-east to south-west. All that part of the village lying north and west of the creek is low, alluvial, poorly drained and saturated. That part of the village lying south and east of the creek is mostly high and well-drained, but a portion on the east side is swampy and poorly drained. On the south-east side also is a small swamp.

The village has been, for the last two years, supplied with spring water from a few miles west of the village, and the authorities are, at the present time, engaged in providing adequate sewerage. The history of diphtheria in Johnstown covers a period of twenty years, the disease having made its first appearance in this place in October, 1860.

The first cases were in the family of Mr. B. H. D———, who at that time lost two children. It is significant that diphtheria was at that time severely epidemic in New York city, that Mr. D———, a merchant in the early part of that month, was in New York buying goods, and that the sickness in his family commenced within a few days after his return. Since that time diphtheria has prevailed in this village to a greater or less extent at various times up to the present. But it is only with the disease as it has prevailed since January, 1878, that this report will deal. Previous to that time there had been no case in the village since March 2, 1877, a period of ten months.

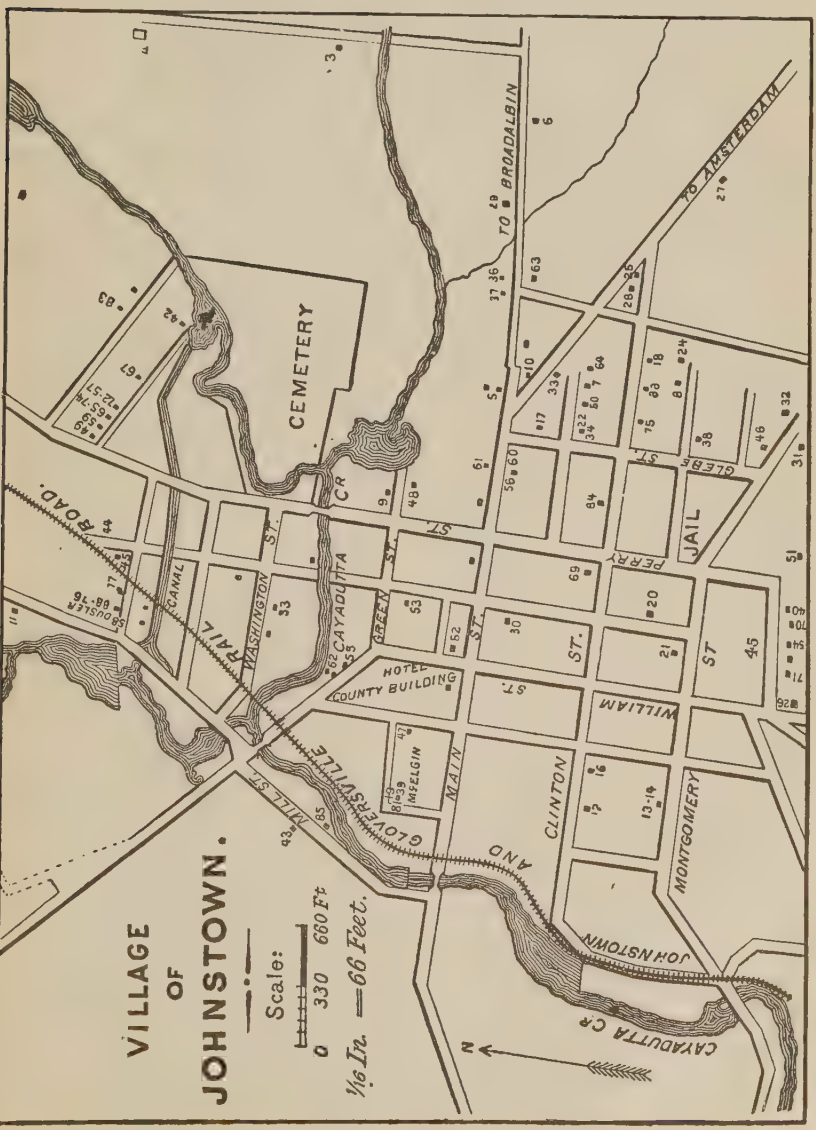
Diphtheria may be said to have been epidemic in Johnstown during the year 1878, prevailing with greatest severity during October, with frequent cases during the years 1879 and 1880. It is a noteworthy fact that no cases occurred during the school vacation from June to September, 1878, and that the disease assumed great violence with the opening of the schools in September.

No public measures against the disease were instituted, except that the schools were closed October 7, 1878, and remained closed for a period of three weeks. The funerals were public, corpse-watching was a custom, and children were pall-bearers at the funerals. Visiting among the sick does not seem to have been feared, and was freely indulged. The disease once introduced spread rapidly from family to family; after a time the school-houses, of which there are four, seem to have become foci of infection, and dwellings became so infected that two and even three succeeding families dwelling in the same tenements after each other have suffered from the disease. One family had diphtheria three times during the three years, and six families twice. Those parts of the village lying in the lower and more poorly drained grounds suffered most, and the disease has lingered longest in them. As a rule these low and undrained portions are inhabited by that part of the population which least obeys and least understands hygienic laws, and this part of the population was most ravaged by the disease. Eighty-four families, including 463 persons, had the disease. There were 219 cases and 61 deaths. Of these 61 deaths 18 occurred during October, 1878.

The residence, when sick, of all the affected families is indicated on the accompanying map. The accompanying table shows the

names of families affected, the number of persons in each family, the number of cases in each family, the date of sickness, the number of deaths in each family, and the date of death.

For many of the facts contained in this report, I am indebted to the kindness of Drs. W. L. Johnson and J. Lefler, of Johnstown, and to the faithful services of Mr. C. E. Morgan, who by his previous knowledge of families and his house to house visitation as the census enumerator, was able to give very valuable assistance.



NO. OF FAMILY.	No. of persons in family.	No. of cases.	Date of cases.	No. of deaths.	Date of deaths.
1. S...	3	1	Jan. 16, 1878	..	....
2. F....	9	4	" 20, "	..	....
3. C....	7	5	Feb. "	3	Mc'h 1 to 11, 1878
4. F....	9	1	" "	1	" 2 "
5. T...	7	7	Mc'h "	1	" 4 "
6. M...	7	1	" "	1	" 12 "
7. O...	3	1	Apr. "	1	Apr. 11 "
8. E...	4	1	May "	1	May 14 "
9. V...	4	3	" "	1	" 19 "
10. D...	4	1	" "	..	.....
11. H...	5	4	" "	1	May 27 1878
12. F....	8	1	" "	..	.....
13. J. ..	5	3	" "	..	.....
14. N...	4	2	" "	..	.....
15. B...	10	5	" "	1	May 24 1878
16. H... *	7	3	" "	1	June 1 "
17. M...	7	6	Sept. "	2	Sept. 15 and 27 "
18. B...	10	7	" "	1	" 28 "
19. McE.	8	4	" "	..	....
20. F...	6	2	" "	..	....
21. S....	5	3	" "	..	....
22. F....	4	1	" "	..	....
23. McD.	5	4	" "	1	Oct. 1 1878
24. J....	7	2	Sept. & Oct. "	2	" 1 and 3 "
25. S....	4	2	Oct. "	2	" 4 and 6 "
26. P....	7	3	" "	2	" 5 "
27. ...	5	1	" "	..	....
28. H...	4	1	" "	..	....
29. P....	9	2	" "	1	Oct. 12 1878
30. K...	7	3	" "	1	" " "
31. P...	8	1	" "	..	....
32. C...	5	3	" "	1	Oct. 14 1878
33. T...	5	3	" "	1	" 18 "
34. F...	4	1	" "	..	....
35. L...	5	2	" "	1	Oct. 19 1878
36. N...	3	1	" "	1	" 26 "
37. D...	5	3	" "	..	....
38. F...	7	3	" "	1	Oct. 27 1878
39. McE.	7	1	" "	1	" 28 "
40. H...	6	1	" "	1	" " "
41. A...	7	7	" "	1	" " "
42. B...	6	5	" "	2	Oct. 31 & Nov. 2 "
43. C. ..	7	5	" "	..	....
44. A...	4	1	" "	..	....
45. S....	5	2	" "	..	....

* No more cases occurred until September after school opened.

No. OF FAMILY.	No. of persons in family.	No. of cases.	Date of cases.	No. of deaths.	Date of deaths.
46. C. ..	5	2	Oct. 1878	..	.....
47. S. ..	10	3	" "	..	.....
48. A. ..	3	2	" "	..	.....
49. K. ..	5	2	" "	..	.....
50. R. ..	4	1	" & Nov. "	1	Nov. 11, 1878
51. C. ..	6	1	" "	.	.....
52. J. ..	3	1	Nov. 25, "	..	.....
53. L. ..	3	1	" "	1	Nov. 28, 1878
54. G. ..	10	7	" "	..	.....
55. R. ..	8	5	" "	..	.....
56. D. ..	4	1	" "	..	.....
57. W...	5	3	" 7, "	1	Dec. 1, 1878
58. W...	2	1	" "	..	.....
59. D. ..	6	3	Dec. "	..	.....
60. D. ..	4	2	" "	1	Dec. 9, 1878
61. M...	4	1	" "	1	" 18, "
62. H...	4	2	" "	1	" 28, "
63. H...	8	8	" "	1	Jan. 1, 1879
64. S. ..	4	3	Jan. 1879	1	" 1, "
65. M...	4	2	Feb. "	1	Feb. 3, "
66. M...	4	2	" "	2	" 15, "
67. B. ..	4	2	" "	2	" 12 and 15 "
68. M...	5	2	" "	1	" 27, "
69. N...	5	1	" "	..	.....
70. G. ..	10	1	March, "	1	March 5, 1879
71. P. ..	4	2	" "	1	" 10, "
72. V. ..	4	3	" "	..	.....
73. S. ..	4	1	" "	..	.....
74. M...	3	1	April, "	..	.....
75. Y...	5	1	June, "	..	.....
76. P. ..	4	2	July, "	..	.....
77. D. ..	5	3	" "	1	July 24, 1879
78. A. ..	7	4	Sept. "	1	Sept. 13, "
79. S. ..	8	2	" "	..	.....
80. V. ..	4	1	Oct. 7, "	..	.....
81. McE.	8	1	Nov. "	..	.....
82. M...	4	2	Dec. "	1	Dec. 1, 1879
83. T. ..	4	4	" "	2	" 1, and 5, "
84. C. ..	12	2	" "	1	" 12, "
85. B. ..	4	1	Feb. 1880	1	Feb. 2, 1880
86. G. ..	4	1	March, "	..	.....
87. W...	4	2	June, "	2	June 4 and 9, 1880
88. D. ..	5	1	" "	1	" 8, "
89. H...	9	2	Sept. "	..	.....

M. W. S.— The first case occurred in this family, but other cases do not appear to have sprung from it. The mother of Mrs. S. resides in Amsterdam. In December, 1877, Mrs. S., with her only child, visited Amsterdam. She there bought a suit of clothes for the boy. Diphtheria was prevailing in Amsterdam at the time; the boy was taken sick on Jan 16, 1878, and recovered. He had diphtheria again in March, 1879.

C. F.— This is one of the families of chief interest, because the source of infection is clearly traced, and because it seems to have been the initial point of the epidemic. This family resides in the farthest north-east corner of the village. The father states that his brother's children, residing in Montgomery county back of Fultonville, toward Amsterdam, had diphtheria, and two died. They were attended by Drs. S. and F. of Amsterdam. After the death of these children the family sent clothing and *a toy whistle* to the brother's children in Johnstown. Dr. J. saw this whistle in the hands of one of the sick children.

M. C. lives in the eastern part of the village; neighbor to F. His children went to school with F.'s children, and Mr. C. thinks they contracted the disease in that way. Three died.

C. F.—This family here reappears in the history. By advice of Dr. J. one child, found unaffected at the time of the sickness of the others, was sent away. Contrary to his advice, it was brought home before the house cleaning, when it sickened and died.

M. T.— Mrs. T. visited C.'s children while they were sick, and *laid out one of M. C.'s dead children.* T. lives on Main street in the east part of the village, where the road to Amsterdam branches from the road to Broadalbin. One child in this family died.

P. M.— Mrs. M.'s mother was at C.'s during the sickness in that family at the same time that Mrs. T. was there. M. lives on the Broadalbin road in the eastern part of the village, and nearer to C.'s than any other affected family. One died.

J. O. lives on Hoosick street in the eastern part of the village. He is of the same nationality as P. M. and C., and probably there was visiting between the families, and perhaps some of the O. family attended the funerals. One death.

E. A. E. lives on Prospect street and is of the same nationality as O., M., etc. One death.

J. Van D. lives at the extreme east end of Green street by the pond. His child, seven years old, went to school, came home sick and died.

W. D. lives at the intersection of the Amsterdam and Broadalbin roads, across the street from the T. family. His child went to school.

P. H. lives on Mill street in the extreme northern part of the village near the yellow mill. *Mrs. H. is sister to Mrs. J. Van D.* One death.

M. F. lives in the south-west corner of the village on Clinton street. His children went to school. No other clue has been obtained.

Mrs. J. J. lives on Montgomery street directly south, across the block from F. Mrs. J. attended the funeral of the T. child. Her boy was bearer at the funeral of the O. child, and was the first of the J. family to have diphtheria. H. N. lived in the house with Mrs. J.

J. B. lived west from the village, out of town. M. B., daughter of J. B., came to nurse Mrs. N., her sister. She then went home and the B. family had diphtheria. One died.

Miss R. H. — The hired girl visited at C.'s during sickness there, and perhaps at other places. She was sick at H.'s. A grand-child of H.'s took the disease and died. During the sickness of the hired girl, who is a niece of Mrs. J. before mentioned, her sister came to care for her, and went home afterward to Stone Arabia, where *she and eight other children in her father's family were attacked by diphtheria.*

H. M. lives on Glebe street in the eastern part of the village. The cases in this family were the first after the reopening of the schools, the last case having died June 1st, and an interval of three months having elapsed. Mr. M. thinks his children got diphtheria in school. Two died.

J. B. lives on the south side of Clinton street, near its eastern extremity. He lives in the same block with E. One died.

J. McE. lives in the western part of the village on McMartin street. The clue to the origin of cases in this family is in obscurity unless it be found in the now infected school-houses.

J. G. F. lives on Market street near the southern extremity of a line drawn from north to south through the middle of the village. Mr. F.'s child may have got diphtheria at school.

R. L. S. is brother to Mrs. J. G. F. Both had children of the same age. He lives on Market street, nearly opposite F.

A. F. thought his child got diphtheria at school. Its mother was dead, and the child was boarding with a family on Glebe street, in the eastern part of the village, near to O. N. M.

E. Mc E. — In this family were three unmarried sisters who were teachers in the schools, and a child who went to school. The child died.

T. J. lived at the eastern end of Prospect street, in the same block with B. and near to E. Two died.

J. J. S. lives at the intersection of Clinton street with the Amsterdam road. The child may have got diphtheria at school and given it to the mother. Both died.

J. H. P. lives at the extreme southern end of William street. The two older children went to school, and probably the oldest got the disease there. He recovered and when he was convalescent he was allowed to be in the company of the other two children, who took the disease from him and both died on the same day.

J. G. F. lives in the eastern part of the village on the Amsterdam road, and near to S. The child went to school.

B. M. H. lives in the same neighborhood west from S. He thinks his child got diphtheria in school.

C. P. lives on the road to Broadalbin west from P. M. The child went to school. About twenty cases broke out on the same day that this child was attacked. One death in this family.

A. B. K. lived on the west side of Market street, near the center of the village. He thinks his child contracted the disease in school. The schools were closed on the same day (Oct 7) on which this child was taken sick. In this family were three cases and one death.

H. S. P. had recently moved from Amsterdam. His child may have got diphtheria in school. He lived at the extreme eastern end of Montgomery street.

J. C. lived across the street from P. and the children of the two families played together. One of C.'s died.

H. A. T. lived on the Amsterdam road in the eastern part of the village west from S. Becoming alarmed at the diphtheria in the neighborhood, he moved to the corner of Washington and Market streets. One child died.

A. F. had diphtheria in his family the second time in October.

L. Z. lived in Hoosick street, in the eastern part of the village. The child died.

H. F. N. lived on the Broadalbin road, opposite Von Clair street, in W.'s house. Mrs. W. attended Z.'s child N.'s child died.

E. H. D. lived next door to N.

G. C. F. lived in the eastern part of the village, on the south side of Prospect street. His children may have got diphtheria in school, or from Dr. L., who visited at the house.

J. McE. — This family had diphtheria in September, and the second time late in October when one child died, October 28.

W. H. lived in the southern part of the village, on Madison street. He is a friend of J. One died.

J. Q. A. lived in the same house with Van D., on Green street. One child died.

C. B. lived in the north-east part of the village, on Beaver street. Mrs. B. is sister to J. Q. A. Two died.

E. C. lived in the western part of the village, on Mill street. Mrs. C. is sister of J. Q. A.

H. A. lived at the northern end of Market street, near the yellow mill. He is brother to J. Q. A.

P. A. S. lives across the street from H. A.

D. C. lives west of C., on Montgomery street.

G. A. S. lives on Melcher street, in the western part of the village. He thinks Rev. Dr. D. brought diphtheria to his family.

A. A. lived on Green street, opposite his brother, J. Q. A.

A. K. lived on Beaver street, in the northern part of the village. One child died.

N. R. lived on Hoosick street, near O. One died.

J. C. lived at the extreme end of Perry street, near McD. and H.

Dr. W. L. J. lives on William street, opposite the hotel. Mrs. J. was taken with diphtheria while nursing the sick with it in the family of her sister, Mrs. McN., in Gloversville. The doctor's only

child was sent away during the sickness of her mother, and was kept away until the house was purified, and *was not attacked.*

Dr. W. H. L. lived on the south-west corner of Market and Green streets. The doctor was in active practice and probably carried the disease home to his child, who died November 28.

N. G. lived on Madison street, in the south part of the village, neighbor to P., McD. and H. Mrs. G. nursed P.'s children until they died, November 5, and her family was taken sick soon afterward.

H. R. lived on Green street, and thinks his children got diphtheria in school, but his wife and one child attended the funeral, in Fort Plain, of two of Mrs. R.'s brother's children, who had died of diphtheria. A few days after they came home the sickness in their family commenced.

L. D. lived in East Main street. No clue obtained.

G. W. lived in the house with E. Van S. on Beaver street. The family thinks Dr. L. brought the disease to the children while attending the mother for some other ailment. One died.

G. M. lived opposite D.'s and D. on East Main street. The child died.

E. H. lived on Green street, next door to H. R. One died.

W. H. lived on Von Clair street; neighbor to N., D., and P. One died.

H. S. lived near the eastern end of Hoosick street; neighbor to several infected families; intimate with J. and H. One died.

J. R. M. — M.'s boy went to visit at her brother's (Van S.'s), while the W. child in the house was convalescing. The Van S. children and the M. children went into W.'s apartments and played with the W. boy. The M. boy died.

M. M. lived on Clinton street east of Glebe; neighbor to B. He is brother to P. M. who had diphtheria in his family in March, 1878. Two died.

E. B. lived next east from W. and Van S. on Beaver street. His child ran away and visited Van S.'s while the latter's children were sick.

L. M. lived on Washington street. The boy was 15 years old and may have been exposed in various ways. He died.

P. N. lived on Clinton street west from Perry. His children went to school.

N. G. — This family had diphtheria previously in November. At this time one died.

A. P. lived in the house with Mrs. G. One died.

E. Van S. lived in the house with W. on Beaver street.

M. W. S. — This family had diphtheria previously in June, 1878.

J. R. M. — When the M. boy was sick the girl was sent away, and she was kept away until one boy had been buried and the house thoroughly cleaned. She was then brought home and a neighbor sent her of an errand to Van S.'s. She died.

S. Y. lived on Clinton street; neighbor to M. and B.

W. P. was the next tenant after Mrs. W. in the D. house.

D. lived next door east from the D. house. Mr. D.'s child went into P.'s while the P. child was sick; was taken sick soon after and died.

H. A. lived across the street from the D. house and D. The child died.

Mrs. J. S. lives in the rear of M. T.'s, and her children went to school.

M. S. Van N. lived on Market street in the northern part of the village. His child went to school.

J. M. Mc E. appears *for the third time* in this history.

F. M. lived neighbor to D., M., K., etc., in the northern part of the village. One died.

M. T. lived next door to M. Two died.

C. C. lived on Clinton street east of Perry. She is intimate with M. and B. One died. This ends the cases for 1879, 42 in number.

George D. Henry lives on the west side of the village across the creek.

D. H. Briggs lived on Mill street west of the creek. No positive clue to this case has been obtained. One died.

S. Gulick lived in a long block of tenements on the south side of Washington street.

James Walker lived next after Gulich in the same apartments, and his family visited the family of D. H. Briggs while the latter's child was sick. Two died.

H Deusler was the next tenant after Preston in the Deusler house. Deusler bought milk of Walker. Sometimes Walker brought the milk to Deusler's and sometimes Deusler went to Walker's for it. Walker's children died June 4 and 9, and Deusler's child died June 8

Diphtheria in Northville, Fulton County.

The sudden appearance and briefly rapid progress of diphtheria, in a limited portion of Northville, in October and the early part of November, had such a relation to the events that had just been occurring in the distant neighborhood in Arietta, that this brief account may properly conclude this record of migrations of the contagious element which, in these instances, became the chief and, apparently, the only factor of causation of this disease. Diphtheria was reported to the State Board of Health, as prevailing in several families at Northville late in October. The Health Officer there replied to our inquiries by the statement which here follows. These facts in hand, the relations of the first cases there with the last fatal case in the family of Roswell Tibbitts, by the carrier, Mr. Flynn, who was the last helper and visitor to the dying child, seem more than probable. The three little children of the family to which Flynn returned, though eight miles out in the wilderness, became infected, and they died and were buried as mentioned in this letter from Health Officer Wright, and as Dr. Beach has

already described, in part. The mother, Mrs. Van Hosen, with ner dead babe and the living members of her family, were received on the night of their arrival at her brother's residence (marked 1 in this diagram), and they were the next morning removed a mile northward (to the house marked as 2). The forty-seven cases of diphtheria which make up the history of the outbreak that immediately followed the arrival of the Van Hosen family, fleeing from their forest home, seem to have completed the record of this outbreak. The corpse was brought into the village the 8th of October. Two others were soon buried from the same family of strangers; the kind neighbors begin to suffer, and the minister who preaches a sermon over an open corpse, in a close little parlor, soon finds his own family has become infected, while the relatives and neighbors suffer severely in their families until, almost as suddenly as it came, the destroyer disappears. The suddenness and brevity of this visitation and the families to which the disease was limited gives much support to the conclusion that the infected family, fleeing from their forest shanty, were the carriers of the disease which so quickly subsided.

NORTHVILLE, *Nov.* 16, 1880.

To the Secretary of the State Board of Health:

SIR — I received your letter and grant your request. We had no diphtheria in or around our village until the arrival of the Van Hosen family. They brought a child from Clock Mill lake to this place for burial on the 8th of October. On the morning of the 9th I was called to see two of their children, and pronounced their disease diphtheria. I had them removed to a hotel about one mile from the village. In a day or two Mr. and Mrs. Van Hosen were also taken. The children both died. There were no other children in the hotel. The next cases I was called to attend were the grandchildren of John McKnight. There were five in the family. The three children and Mrs. McKnight had diphtheria and all recovered. As near as I can trace this case, some ladies were in the house where the Van Hosens were; then went to John McKnight's.

PART OF NORTHVILLE.

Explanation of the Chart in which Diphtheria Occurred.

No. 1, the house where the Van Hosens first were, October 9, 1880. No. 2, the hotel of William Martin, where the Van Hosens were taken. No. 3, John McKnight first called, October 16. No. 4, John Van Vranken, October 23. No. 5, Joseph Crowter, October 25. No. 6, William Crowter, October 26. No. 7, Robert Crowter, October 29. No 8, George Crowter, October 30. No. 9, Col. Orcutt, October 30. No. 10, Silas Gifford, October 31. No. 10, William Gifford, November 4. David Hines, same house as Robert Crowter, November 5. No. 11, Rev. J. E. Moore, November 5. Charles Hall resides north of the line in Hamilton county.

The next case was at John VanVranken's family, which numbered six. Five of them were taken with diphtheria and they lost one child. As near as I can trace this case it came about as follows: A brother-in-law of VanVranken was at the hotel where the VanHosen family had been removed, and then proceeded to VanVranken's house. The next case occurred at the house of Joseph Crowter. The family here numbered six; five of them had diphtheria, but all recovered. Crowter had also been at the hotel where the VanHosens were. The next case occurred at the house of Wm. Crowter, in a family of five. Four of them were taken, but all recovered. Some of them, it appears, were at the house of Joseph Crowter. The next case occurred at the house of Robert Crowter, in a family of seven. Six were taken down, but all recovered. Some of these were at the house of Wm. Crowter. The next case occurred at the house of George Crowter, in a family of five, four of whom were taken, and one died. George Crowter, it appears, was at the same house as the VanHosen family. The next case occurred at Col. Orcutt's, in a family of four. All were taken, and one died. Some of the Orcutts were at the house of one of the Crowters. The next case occurred at Silas Gifford's place. His wife was taken, but recovered. She had watched over the Orcutt children. The next case occurred at the house of William Gifford, whose wife was taken, but recovered. She had been at the house of S. Gifford. The next case occurred at the house of David Hines, in a family of five, three of whom were taken, but all recovered. Hines had moved into the house with Robert Crowter. The next case occurred at the house of the Rev. Mr. Moore, whose wife was taken. He had preached a funeral sermon at Col. Orcutt's place; she recovered. The next case occurred at the house of Charles Hall, in a family of six. Five of them were taken, but all recovered. I am unable at present to trace this case.

If there is any thing I have omitted that will be of value to you, please let me know.

(Signed) F. N. WRIGHT, M. D.,
Health Officer at Northville.

The foregoing statements have served to show that in tracing the progress of diphtheria from place to place the connecting links need to be closely observed, and that any effectual sanitary restraint upon the propagation of the disease must be so thorough as to discover and control the means by which it is spread.

What Sanitary Measures Were Adopted.

The following note of advice was immediately printed and distributed as widely as possible:

"HINTS FOR PREVENTING DIPHTHERIA."

By request of the Secretary of the State Board, these printed suggestions are distributed in Arietta and the neighborhoods that may be exposed to the spread of that disease from families that are, or recently have been, afflicted with it.

Diphtheria is an infectious disease, readily spread by the sick and by clothing which has been about the sick-room. The room itself is apt to retain and spread the infection. It is to be avoided by great carefulness to have the sick and their clothing and the persons who nurse the sick, kept entirely away from others, especially from children.

The sick must be nursed in a clean and airy room, on a floor where there are no other children.

Every cloth and cup, and all clothing and bedding used in the sick-room, must be cleansed and disinfected before other persons are exposed to them. The room itself must be disinfected as soon as the sick recover or die.

The Cleansing and Disinfection. — Open windows, and open fire-places with fire in them day and night, protect the sick and all who attend them. The cloths and dishes used by the sick should be put into boiling hot water, as soon as removed, without being taken to another room. The soiled clothing of the sick and their beds that can be boiled should be thrown into a disinfecting fluid, made by dissolving four table-spoonsful of sulphate of zinc (white vitriol), two table-spoonsful of common salt in a common pailful of boiling water. When the time for washing comes, boil the clothing, etc., before washing.

The woodwork, chairs and stools of the sick room should be washed with the disinfecting fluid. The chamber vessels and spit-cups used by the sick should be drenched with this fluid before they are removed from the room.

The grounds just about the house, the ditches and drains and the privy and chip-yard must be drenched with the cheap solution of green copperas (sulphate of iron), made by dissolving five pounds of this dry copperas in a large pailful of water.

As soon as the sick room is vacated let it be fumigated with sulphur (brimstone), and let all rugs, beds, blankets, and other furniture remain in the room and near where the kettles or pans of sulphur are placed. From two to four pounds of sulphur, or broken brimstone, laid upon ashes and coals will be necessary for fumigating an ordinary chamber. The physician will direct how to do this; but it will be well done if the rooms to be fumigated are so closed that the suffocating fumes do not escape from flues and crevices, and the burning ceases for want of fresh air before all the sulphur is consumed. Let the fumes be kept shut in all day. Next, let all plastered portions of the room be well lime-washed. Let the bottom and sides of cellars be sprinkled with fresh slacked lime.

The sick should be nursed by adult persons who have no children about them.

Children and visitors should keep away from the house where there is diphtheria. The burial of those that die should be strictly private.

It is a public as well as a family duty to apply these sanitary rules wherever a case of diphtheria occurs.

Dr. Beach and Dr. Burdick extended their counsels and assistance far and wide in the regions exposed to the Arietta hamlet, and there was an unlooked for alacrity and thoroughness in the compliance of families with the advice and rules thus prescribed. The single failure to reach a remote cabin in the forest eight miles away at Clock Mill lake, was followed by the calamity which Dr. Wright, of Northville, has reported. The death of the last child in Mr. R. Tibbitts' family was the occasion for a sympathizing forester to assist the family, and, unwittingly, to become the carrier of the infection which smote the Van Hosen children, without harming him.

Conclusions.— Though it is needless to comment upon the records here given, it is important to notice the terms in which Dr. Beach, who, from a noble sense of duty, traced the spread of this malady, briefly summarized his work. He wrote, when transmitting his report in November:

"Your request for my assistance in endeavoring to trace the origin of diphtheria in Arietta, Hamilton county, has resulted in the report which is herewith handed you. It gives the history of the cases in Arietta up to the present time, followed out to ramifications in Northville and Benson, together with the history of the epidemic which has prevailed in Johnstown during the last three years, and incidentally traces an epidemic which occurred in Wells during the same period.

The diphtheria in Arietta has been positively traced to the infected Duesler house in Johnstown. That in Johnstown was traced to infected clothing sent from Montgomery county; and that in Wells, to Hope Falls and to Johnsburg.

The conclusion seems almost irresistible that the greater part of all this sickness and death could have been prevented by proper sanitary measures *rigidly enforced* by some proper authority. If the State Board of Health can instruct the people, stimulate local boards and then assist them in enforcing proper measures, it will be of inestimable value.

I believe city and village authorities should compel the thorough disinfecting of houses, etc., and quarantine diphtheria as closely as small-pox.

Truly yours,

(Signed) EUGENE BEACH."

Whether as the healer or saver of people exposed to fatal diseases, no physician will fail to deserve the thanks of the whole State who thus aids in protecting the public health. The duty to apply promptly and discreetly the best means of sanitary protection are known to be available without debating the doubtful and unavailable questions that may lead to inaction, seems to be well proved in the reports here given.

Brief Account of the Epidemic of Diphtheria in Morris and Laurens, Otsego Co., N. Y., during the Autumn of 1880.

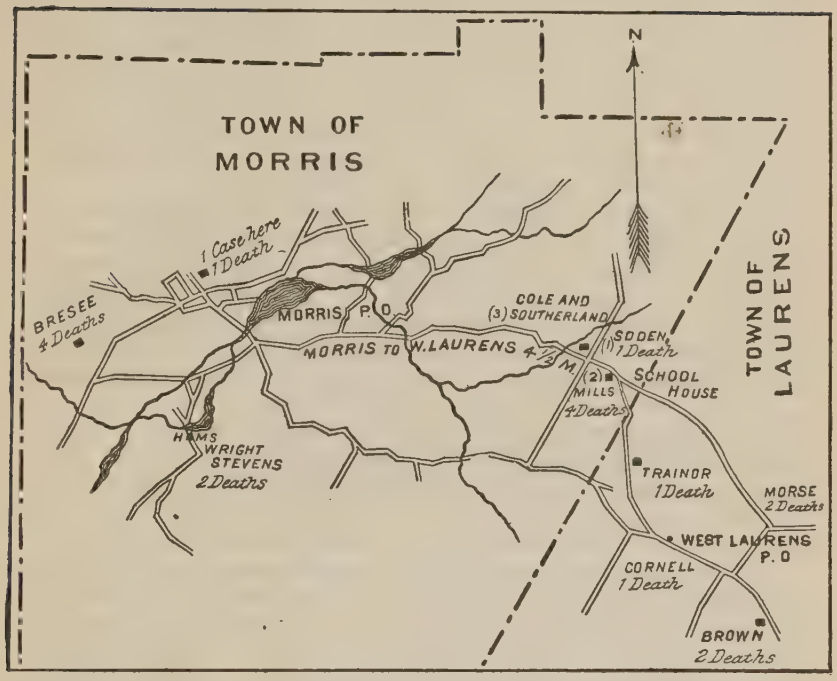
During the last autumn a citizen of the town of Morris, Otsego county, sought information from the State Board of Health concerning the best means of preventing the further spread of diphtheria in Morris and the adjacent town of Laurens. The history of the outbreak there is briefly given as follows, and is illustrated by a road and house chart upon the next page.

The Health Officer of the town, as requested by the local board of Morris, has prepared this account.

(1.) The first case — Lewis Soden, aged 6 years, was attacked June 20 and recovered; John Soden, aged 4½ years was attacked June 23 and died July 6. The origin of this first case is not positively known, but it may have originated from exposure to a young man from Gilbertsville, who visited the Soden family while he was suffering from glandular inflammation of the throat, said to have been caused by a mild attack of scarlatina, for which he had no medical attendance; or it may have had its origin in the family of a neighbor visited by the children, and where an old lady of seventy years suffered from a sore throat for which she had no medical attendance, but children living in the house with her had no throat ailments. A woman living in the Soden family died a few weeks previous to the outbreak of diphtheria with peritonitis, following a miscarriage. There is nothing in the location or surroundings of the Soden house known to be likely to give rise to diphtheritic poison, the house being on the top of a high hill.

(2.) Ida Mills, aged 6 years, was attacked July 11 and died July 24; Jessie Mills, aged 3 years, was attacked July 14 and died July 17; Mary Mills, aged 8 years, was attacked July 14 and died July 24; Minnie Mills, aged 16 years, was attacked July 16 and died July 27; Mrs. Mills was attacked July 18 and recovered. Mr. Mills' sister was attacked July 23 and recovered; Mrs. Mills' sister was attacked July 27 and recovered. The Mills family lived across the street from the Soden house and were exposed by visiting the Soden children.

MAP OF MORRIS AND LAURENS.*



(3.) A school-boy, named Cole, aged 11 years, and boarding in the family of a Mrs. Southerland, was attacked July 15 and recovered. This boy attended school near the Mills house, and was in the habit of playing with the Mills children, and was in the habit of attending school with them. When the boy recovered he was placed in an upper room to sleep. Up to that time Mrs. Cole, his mother, had chief care of the lad. On Monday, August 23, Mrs. Southerland washed the clothing that had been left in the sick room, and on Thursday evening was severely attacked. She recovered.

(4.) Albert Harris, aged 10 years, was attacked July 18 and recovered; Mr. Harris, aged 33 years, was attacked July 22 and recovered. This family lived three miles from any of the other cases, but had been exposed by the Cole boy, who visited and played with the Harris boy July 15, the day on which the Cole boy was attacked.

(5.) Mr. Clarence Bresee, aged 25 years, was attacked July 20, and died July 27; Lewis Bresee, aged 5 years, was attacked July 28, and died July 30; Chester Bresee, aged 3 years, was attacked July 29, and died July 31; Fred Bresee, aged 1 year,

* The road-map covers more territory and cases than my report. These West Laurens cases were in neighborly contact and no especial attempt was made to isolate of disinfect, so it is fair to presume that the spread of the disease was from contagion in those cases.

was attacked August 1, and died August 5. This family resided on another high hill, parallel to, and five miles south-west from that on which all the other cases occurred, but the father, Mr. Clarence Bresee, was the undertaker who attended to the coffining and burial of one of the Mills children. No other cases have occurred this year on West hill where the Bresee family resided. There were no causes of the disease in the Bresee residence, except those which resulted from Mr. Bresee's going to Lauren hill, five miles away, to take charge of the corpse of one of the Mills children.

(6.) Ernest Wright, aged 9 years, was attacked August 30th and recovered; Earl Wright, aged 9 years, was attacked September 3, and died September 9; Nelly Wright, aged 11 years, was attacked September 4, and recovered; Mrs. Wright, aged 33 years, was attacked September 5, and recovered. The infection here is traced to the Harris cases, as the children were playmates, but a month elapsed between the time when the Harris boy was discharged cured and the time of the attack of the Wright boy.

(7.) Mrs. Stevens, aged 50 years, was attacked September 6, and recovered. This woman lived in the same house with the Wright family, and was in the Wright apartments. She had a light attack, but with the diphtheritic exudations and, although she had a large family, none of them contracted the disease at this time.

(8.) Nettie Harris, aged 12 years, was attacked October 17, and died October 23. This girl was one of the family in which the disease appeared three months previous, but she escaped at that time. She had played with the Wright children since their recovery and slept in the Wright house. Six weeks elapsed between the outbreak in the two families.

(9.) Lillie Stevens, aged 3½ years, was attacked October 24, and recovered; Fred Stevens, aged 14 years, was attacked October 29, and is convalescing; Charlie Stevens, aged 6 years, was attacked November 3. These children live in the house with the Wright family, and the one first attacked was frequently in the Wright tenement, but not until the expiration of some eight weeks after the Wright children were sick.

The accompanying road-map shows where these cases of diphtheria occurred.

At a meeting of a majority of the justices of the peace and the supervisor of the town of Morris, held October 20, 1880, present Isaac Mansfield, D. C. Winton and S. S. Matteson. On motion they were organized as a Board of Health. Isaac Mansfield was elected president, and S. S. Matteson, clerk. Dr. Merritt Matteson was appointed health officer for the town of Morris.

At a meeting of the Board of Health of the town of Morris, held October 20, 1880, present Isaac Mansfield, S. S. Matteson, and D. C. Winton, the following resolution was offered, and on motion adopted:

Resolved, That in all places where contagious or infectious diseases exist, the health officer be instructed to cause the place where any

such disease may exist, to be properly disinfected by fumigation or otherwise, as he may deem best. And he be further instructed to cause all clothing or other articles used about persons suffering from contagious or infectious diseases, to be properly cleaned and disinfected or destroyed, as may be necessary to prevent the spread of disease.

They adopted and published the following:

Sanitary Regulations.

(1.) All privy vaults, water-closets, pigstys, drains and sewers shall be kept constantly and effectually disinfected by the use of earth, ashes, copperas or other disinfecting agents from May to October inclusive.

(2.) All slaughter-houses within 20 rods of any dwelling or highway shall be thoroughly disinfected daily, when in use, and no refuse shall be left unburied in or about the premises for more than twenty-four hours, from May to October inclusive.

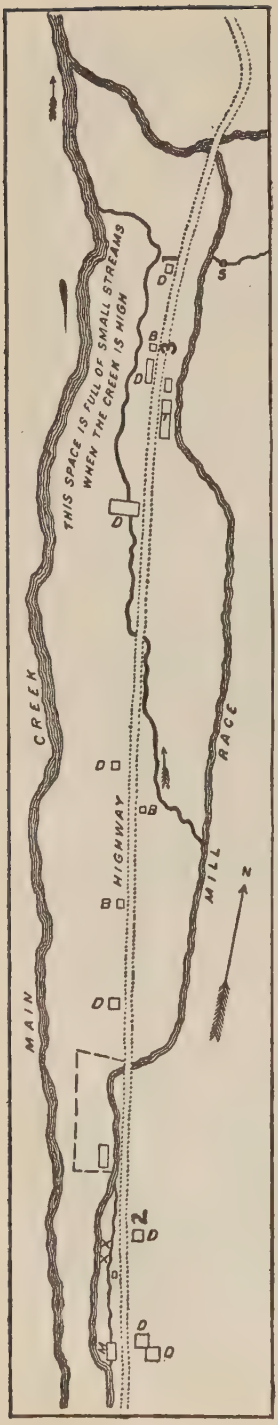
(3.) No carcasses of dead animals shall be left exposed or thrown into any stream or body of water, from May to October inclusive; but all such carcasses shall be buried under at least one foot of earth.

4. It shall be the duty of every physician or other person having charge of any person sick with small-pox, diphtheria, typhoid or scarlet fever, to report the facts immediately to the health officer, or one of the members of this Board. And it shall be the duty of the persons in charge of such sick to cause them to be separated from all other persons, except those who have the care of them; also to keep the rooms where the sick are, well ventilated and cleansed, and to use every precaution to prevent the spread of the disease.

It shall be the duty of the health officer to give to all persons having charge of persons sick with any of the above-named diseases, and to all households where the sick are, all needed information and aid in disinfection, and the sanitary care of infected material and places.

(Signed) MERRITT MATTISON, M. D.,
Health Officer.

The authorities of Morris have kept this Board informed of the progress of events in that region. The health officer reports: "No cases of diphtheria have occurred since November 3." And he adds: "Immediately upon the organization of our town board of health, vigorous measures for disinfection were adopted, and complete isolation of the sick was required, as well as of infected apartments. We now have no diphtheria..... In 1861, diphtheria first visited this locality, and all situations, seasons and classes of persons seemed alike subject to it; and so mysterious were its ways and means of propagation that the people came to believe it useless to try to avoid it."



Diphtheria in Waterville, Oneida Co.

I hereby send, in accordance with your request in your note of October 30, a report of twenty cases of diphtheria, which we have had in our vicinity.

September 15, 1880. Called to see a girl sixteen years old, who had been complaining of sore throat for two or three days. She had diphtheria of a moderately severe type, but convalesced after about two weeks.

September 23. A brother two or three years younger was affected in same way, and also recovered in two or three weeks.

September 24. Another child, aged five, was taken sick, a more malignant attack; the throat and air passages soon becoming involved, and death resulted on the 30th.

September 26. A boy of eighteen came down sick, moderately; recovered.

During the illness of the youngest child the mother complained of her throat, but no patches were seen. The father and one boy of twelve escaped.

These cases were in the house marked one (1) in the diagram.

October 4. A female child, age seven, living in house marked two (2) was seen. Had been sick a day or two. Had malignant type, and died on October 6.

Two other children in same house had sore throats. Recovered. No adults sick.

About October 1, a boy aged ten, in house marked three (3), was taken sick, but was treated by the family.

October 10. A girl eight and boy six were attacked with a severe type, and though quite sick, have convalesced.

Another girl, older, was taken about the 20th, but not severely.

Treatment in all cases was: Chlorate of Potassa, frequently; Tr. of Iron, and Persulp. of Iron, locally. Alcoholic stimulants and milk.

Whole number of cases	12
Malignant cases.....	5
Deaths	2

The inclosed diagram represents a part of the valley extending form Waterville to Deansville. The section shown is about

one-quarter of a mile from the village of Waterville, and the road to it is lined by the poorer class of houses.

The creek is formed by the overflow of a pond in the village, the pond itself being fed by two streams which, as they come through the village, receive the sewage from many of the houses, by drains and privies placed over the surface of the water, or on the banks. A grist-mill and lager beer brewery are situated on the creek just above the mill shown in the diagram. The mill itself is a paint-mill, and very little work has been done in it for some time. At the hop extract factory there are no deleterious products, except gases, for the refuse of the hops are at once carted away for manure.

The tannery is not running, and has not been for at least two years, but there are old vats full of the tanning liquor, and sufficient refuse, such as old hair and scrapings, lying about to cause an offensive odor in hot weather.

House No. 1 is a double house, with three or four rooms to each tenant. The sick were all in the northern side; the cellars were cleaned in the early summer, but have been damp and wet, after the least rain.

The privies are connected with the house by half-open sheds, and have no vaults, but were placed on wooden posts just at the bank of the small brook, which has been dry since September 1.

The excrements were exposed on the surface of the ground, and had only been removed once during the season. The water supply was good, the spring across the highway being the opening of a wooden pipe which brought the water from a clear spring fifteen or twenty rods away, just at the foot of a hill. The pipe is under ground, and mostly composed of log tubes.
bored through them.

House No. 2 is a better built house, with a basement half above ground under a part of it. The most objectionable thing about the premises is a cowshed and pig-pen just across the road, indicated by the (xx) crosses. This is always filthy, and has only been partially cleaned once during the season.

Some of the women at this house were at the first house while the children were sick, and nearly all were at the funeral of the boy.

The water supply is another spring and pipe, also coming from the same hill, but much nearer the road. Privy behind the house, and with imperfect vault.

House No. 3 is a long, one-story affair, and very old. Has a wet cellar, water in it after a day's rain. Better care of the cellar had been taken by the tenant than in the other cases. Privy just behind the house, and connected with it. No vault, but had been cleaned twice. Water supply same as in house No. 1. The woman of this house had taken care of the children in house No. 1, but had *taken pains daily to change her dress in an out-house* before returning to her own children; had done this all the time, she says. All the families were Irish and of about ordinary intelligence. To me it seems that the cause of the outbreak in the first house, at least, was the general filth, together with the wet cellar, defective privy, and

lower water than usual in the creek. The other cases may have arisen from contagion, but if so they found a very favorable condition of things for development. It is not my province as a reporter to suggest how these cases could have been prevented, but if the cellars had been cleaned and drained and cemented, the privies properly constructed and cleaned, the creek kept in its proper channel, where it would have current enough to carry off the sewage from above, the first family were quarantined as strictly as if the disease were small-pox, and the first funeral a private one, some, at least, of the cases would not have occurred. There have been no more cases as yet.

Respectfully,

C. WILSON, M. D.

Waterville, N. Y., *Nov.* 11, 1880.

A Brief Account of Diphtheria at Harmony and Busti, Chautauqua County.

To The Secretary State Board of Health ;

Dear Sir — In answer to your letter of inquiry concerning diphtheria in Chautauqua county, I would say that, during the winter of 1880, there were but few cases of diphtheria in the town of Harmony. I treated only three until June 12. Then there was an outbreak in school. The first cases were of malignant form. Medical aid was called, but too late. Three children died in about thirty-six hours. Those who received treatment in season recovered. The school-house was situated on dry ground and near a cider mill, around which were, perhaps, 500 loads of apple pumice and rotting straw. These children had impure water to drink when at school, but resided on elevated ground. I do not know of any other causes than those here stated.

Since June 12 I have treated twenty-three cases of diphtheria. As near as I can ascertain, there have been in the town about sixty-seven cases since June, with twenty-two deaths. There has been no scarlatina or croup complicated with diphtheria. In some families only one child out of four or five has come down with diphtheria ; in others, nearly all. As far as the situation on high or low ground was concerned, there was no real difference ; the most occurred on elevated ground. As a great many wells are dry, or nearly so, throughout the town, the water is generally in a bad condition. The school-house mentioned above was well ventilated, and the water-closets were in good condition.

Respectfully yours,

J. J. BOWEN, M. D.

Ashville, Chautauqua Co., N. Y., *Nov.* 18, 1880.

Diphtheria in Schuyler County.

Dr. A. P. Hallett, of Havana, reports the following facts concerning an outbreak of diphtheria in a rural neighborhood between Havana and Millport:

At a point on the hills, about 350 feet above the level of Seneca lake, two miles east of the valley running between Horseheads and Watkins, in which we have the abandoned Chemung canal, and about three miles south-east of Havana, Schuyler county, in the fore part of November, 1880, there appeared a case of diphtheria. This was successfully treated by an old school physician, and ran a course of from eight to ten days. The patient was a married lady in the prime of life. As she improved, her little daughter was taken with the disease, and was treated by the same physician, assisted by another. In six or eight days the case terminated fatally. Three days after the death of the child, I was called professionally to the aid of the family, on November 25, 1880, and found sick in the house the father of the child who had died, a man about 35 years of age, and a little boy, residing in the family, about 11 years old. Both patients were confined to the bed, unable to sit up, yet the man had been taken sick during the night, and the boy had made no complaint until waking that morning. The bodily heat, with the febrile symptoms generally, were more intense in the man, yet in both they were considerable, with a quick and wiry pulse. During the course of the disease, I found that these febrile symptoms were more intense in the fore part of the night, with an abatement in the morning and the early part of the day. There was some eruption on the skin of *Roseola febrilis*, which was more marked, as I am informed, in the first case, that of the mother. On examination of the throat we found the fauces of a dark red color, the tonsils some swollen and difficulty in swallowing and breathing. In the case of the boy we found some small whitish-gray spots on both tonsils, while in the man the membranous formation was more of an ichorous mass of a pseudo-purulent character, together with the peculiar odor characteristic of the disease. All of these symptoms were accompanied by that peculiarity of the disease of feeling intensely sick. I treated both of these cases, and from the first had an amelioration which continued until I pronounced my patients convalescent. The convalescence, though slow, continued until they were entirely restored to their ordinary health. On the 1st of December, a young man, about twenty years of age, residing in the family, was attacked by the disease and was treated by an old-school physician, assisted by council, the choice of himself and father. I did not see the case at all, but was informed that it was similar to those treated by myself, and that he continued to grow worse until his death, which occurred on the 6th of December.

Some of the questions of interest to us in connection with the promotion of the public health that present themselves in the consideration of these cases are: Where, or from what source, was the contagion derived, if the disease is contagious, or if it is not from

contagion, what was the cause of the sickness. For the last four or five years there has been more or less diphtheria and scarlet fever in the adjoining county of Chemung, particularly in the city of Elmira and the village of Horseheads, and especially, I am informed, this fall and winter. The family inform me that within a week or ten days of the breaking out of the disease, the man, his wife, who was first attacked, and the little child who died, went to Elmira with their horse and carriage, remaining in the city an hour or two to do some trading, returning again direct to their own home. They think that this is the only way in which they could have come in contact with the disease, yet, on further inquiry, I find that the disease was at the time prevailing in the family of the mother's father, where three children had been sick, with one death. They say that the families were not back and forth during the sickness or death and that the only communication between them was by letter. Could this outbreak have arisen from contact with cases in Elmira, carried in the letters, or was it the result of some local cause? I examined the premises with the other physicians, but we could not attribute it definitely to any local cause. A suspicion was raised that a spring from which the family were using water might have something to do with the attack. This spring was located in a field in which cattle were allowed to run, and was without protection, except a covering of boards, the cattle drinking from a trough a little lower and supplied from the spring. The spring was on low ground, between two barns, about twenty or twenty-five rods from each. The slope from the barn to the south was more abrupt from the spring than toward it, so that the heft of the drainage was in that direction. The other drained toward the spring, but a small stream intervened which had its surface at least two feet lower than the spring. Could this spring have become contaminated by the drainage of the barns or from the droppings of the cattle around it? We advised that it would be better for the family to use water from other sources. The house in which lay the sick was in a fair state of repair, light and dry, standing on a knoll with the ground sloping in every direction from it, and there was nothing observed to be offensive. There was an old well, which was dry, under the side veranda of the house, but there was no odor from it. Disinfectants were freely used and the house was as frequently aired and fumigated as the condition of the patients would permit. We believe that the attack was the result of contagion, holding that diphtheria is contagious, and that it might be, and probably was, augmented in its severity by the use of the water from the spring. From past experience, especially in the severe epidemic of the disease that prevailed in different parts of this county in the years of 1876 and 1877, we believe that miasmatic influences have something to do with the prevalence of the disease. During the winter of 1876 and 1877 diphtheria prevailed in Watkins to a fearful extent, while in Havana, only three miles away, we had but very little of it, and what few cases occurred were of a very mild type. I believe that this was due to the greater miasmatic influence in the one place than in the other, and also to the fact that the water

supply in Havana is better, coming as it does from artesian wells from thirty to sixty feet deep. We find that intermittent fever exists to a considerable extent in Watkins, which we believe is due to the prevalence of south winds, especially in the mornings, carrying the malaria from the marsh between Havana and Watkins into the latter place. We also find that the disease has prevailed in other sections of the county where malarial fevers have existed to a greater or less extent, although some of the localities are at a high altitude, as in the cases reported. Would it not be worthy of consideration to determine what influence, if any, the abandoned Chemung canal, the condition of which has already been brought to the attention of the State Board of Health, has upon the prevalence of the disease along the valley in which it lies? In Havana the canal bed has been drained by direction of the trustees of the village.

These are the only cases of diphtheria brought to our attention in this county, and they were on the southern border of it, adjoining Chemung county, where, as we have said, it prevails to a considerble extent. In Watkins a good many cases of scarlet fever exist, with some deaths, but no cases at Havana or any other part of the county that we are informed of, and we believe at present, with these except tions, that this county is comparatively free from epidemic or contagious disease. (Signed) A. P. HALLETT, M. D.

Havana, Schuyler Co., N. Y.

Report of Epidemic Diphtheria in the Village of Geneva, during the years 1878, 1879.

To the Secretary State Board of Health:

Sir — In answer to the questions you addressed to me in your letter of inquiry, I would say, in reference to the epidemic of diphtheria which prevailed in Geneva, Ontario county, N. Y., during the years of 1878 and 1879, that in many respects it was one of the most severe, persistent and malignant epidemics that ever visited this beautiful village.

Geneva has nearly seven thousand inhabitants. It is situated at the foot of Seneca lake, partly upon a bluff on the west side of the lake, and extending north and east and around the foot of the lake where the lowlands follow the course of the canal toward the outlet of the lake; but very little of the lowland is overflowed by water.

The cases and groups. — May 18, 1878, the first case was reported to the Board of Health. It occurred in Mr. DeWitt's family, living on the lake road at the foot of Seneca lake. Five cases were reported in the same family in one week, and the death of the youngest child, aged 14 months. June 16, the sixth case was reported from the same family. (See No. 1, on the accompanying map.)

The next case reported was on the 6th of September, 1878, from a residence on Poultney street. September 9, a case was reported on Washington street, opposite the cemetery. September 16, a case was reported on William street. September 16, a case was reported

residing on the Mr. Garrett Smith place, in the extreme south of the corporation, — the son of James Grinder. Six of his family were reported between September 16, and October 1. September 25, four cases were reported in one family on Hamilton street; September 28, two cases were reported on Colt street; September 29, one case on Colt street; September 30, three cases on Grove street, and on October 1, one case was reported on Tillman street.

From October 1 to October 31 seventy cases were reported, and they occurred in every portion of the village. Cases were reported almost every day during the months of November and December, and continued during the winter and spring and at intervals during the year 1879.

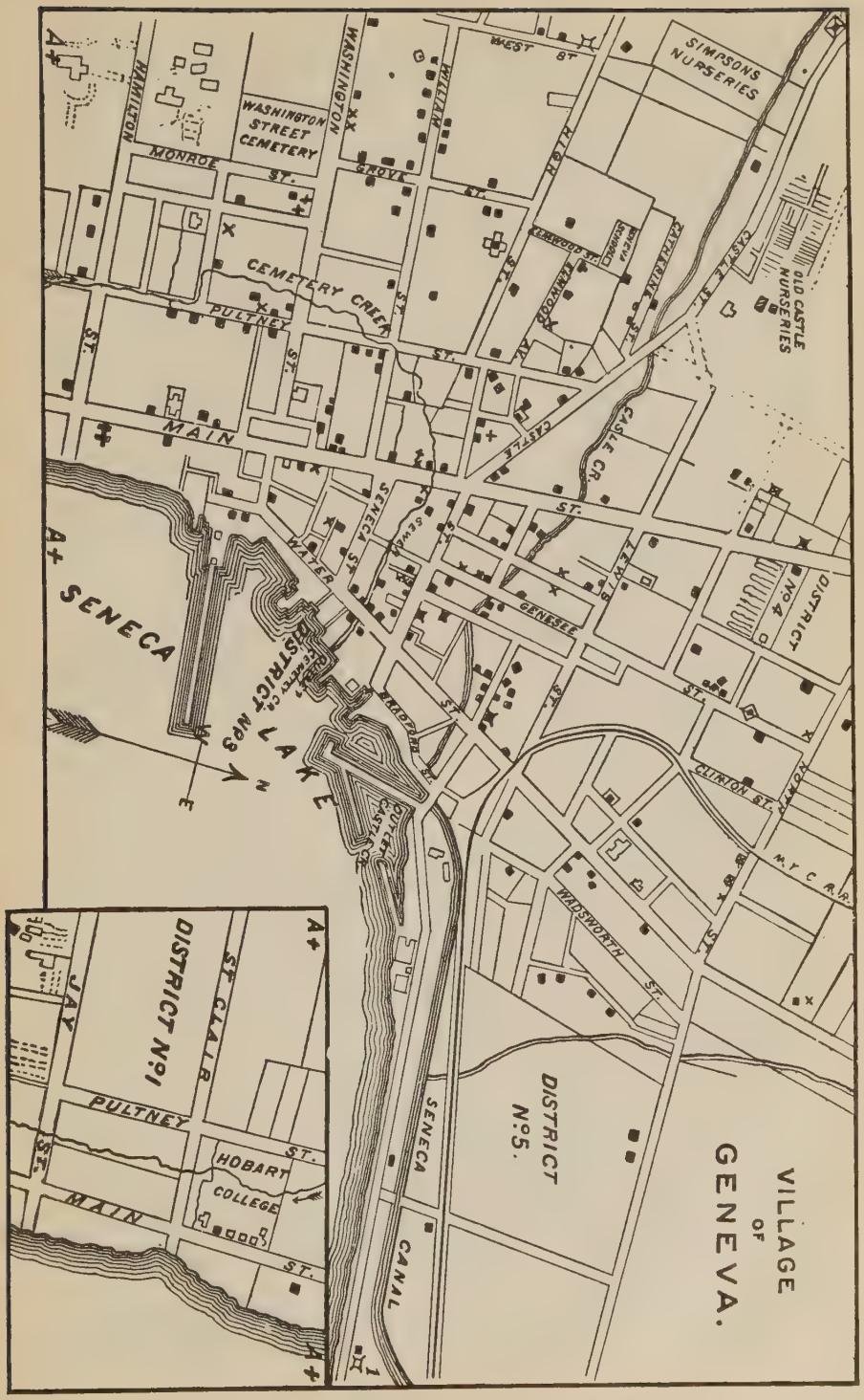
Evidence of infectious communication of the disease. — As regards the infectious communication of the disease, I have not the least doubt, especially when it assumes the malignant type, as was the case in very many instances during the epidemic in Geneva. I might mention numerous cases where there could be little doubt it was communicated from one to another; for example, the following:

C. H. Carpenter, M. D., one of our physicians, had been in attendance upon a number of malignant cases which proved fatal, including his only son, 11 years of age, who died November 23, 1878. On the 26th of November, three days later, Dr. Carpenter was attacked with malignant diphtheria and died on the 1st day of December. On the 29th of November, his brother, Prof. Stephen Carpenter of Madison University, Wis., a strong, robust looking man, came to visit his brother and administer to his wants. He remained with, and assisted in the care of his brother until his death. December 3, Prof. Carpenter was taken sick in the same house, and died December 7, 1878.

Miss O———, a young lady who returned from school in Canada to spend two weeks' vacation at home, five miles from Geneva, came to this village to do some shopping and call upon a friend who was just recovering from diphtheria. Two days after she was attacked. She died on the fourth day of her sickness.

A physician was called out of town to attend a child-birth, after having visited a number of cases of diphtheria, as usual, daily. Within three days three children in that family were attacked with diphtheria, and they all died within a week, no obvious local cause was found, and the family resided out of the village. I recall many cases where, in my opinion, the disease was communicated by its infectious character.

Evidence of local contributing causes.—I would say, as regards the evidences of any local contributing cause, that I believe, in such old towns as Geneva, where filth has been accumulating for years, and where there is no regular system of drainage and the soil is thoroughly saturated with impurities and poisonous gases, such conditions have an influence and thus act as contributing causes to aggravate whatever form of disease is prevalent, be it diphtheria, scarlet fever or any other zymotic disease. Our village was not in a proper sanitary condition during the epidemic.


VILLAGE OF GENEVA.
DISTRICT No.5.
DISTRICT No.1
SENECA LAKE
SENECA CANAL
WASHINGTON STREET CEMETERY
SIMPSONS NURSERIES
OLD CASTLE NURSERIES
CEMETERY CREEK
CASTLE CR.
MAIN ST.
WEST ST.
MONROE ST.
PULTNEY ST.
GENESEE ST.
CLINTON ST.
WADSWORTH ST.
HOBART COLLEGE
JAY ST.
ST. CLAIR ST.
N.Y.C. R.R.
WASHINGTON ST.
WILLIAM ST.
MAIN ST.
CASTLE ST.
CAMERON AV.
CHARLTON ST.
SENECA ST.
WATER ST.
FERRY ST.
FLEWWS
DISTRICT No 4
A+

Some of the most malignant cases of diphtheria were near Castle creek, and also Cemetery creek. The former starts opposite T. C. Maxwell & Co.'s nursery office, and extending to the canal, empties itself between the canal bridge and S. L. Jones' lumber yard All along the length of this creek, from the starting-point at Maxwell's, there may be found drains from dwellings on both sides of the creek emptying their contents into this open sewer, as well as many privies built over the same, which increase the filth. During the summer months, and until after fall rains, this creek is nearly dry and does not carry off the refuse matter which consequently remains upon the bed of the creek for months.

Cemetery creek, starting from Hamilton street, is the outlet for all drains and sewerage for the village, north of Hamilton street, and all west of Poultney street, including all on Washington, William, High, Milton and Castle streets, from North Main, and all the stores and dwellings on Seneca and Castle streets, the creek running between the streets and in the rear of the main business blocks of our village, all emptying into Cemetery creek, which has its outlet in the rear of P. Riley's premises on Exchange street. This creek, during the year 1878, was in bad condition and very offensive. This summer (1880) the village has constructed a barrel sewer from the lake back to Linden street.

We have a creek extending south from Hamilton street to Mile point and into Seneca lake. All south of Hamilton and on the west side of Main street drains into this ditch, which passes through the college campus. There is very little, if any, water in this creek except in spring and during the rainy season. The descent is very gradual and the stream very sluggish at best, and during 1878 and 1879 was in bad condition.

On the east side of Main street, from Mile-point to Seneca street, we find most drains running to the lake or to cess-pools upon their own premises. The north and east portion of our village has little provision for drainage, and consequently the slops from the dwellings are cast upon the surrounding grounds. The lake south of the Franklin House to the long pier has been in a filthy condition, owing in part to the low water in the lake, and also to the fact that the drains are uncovered, and empty their contents upon the surface at the water's edge. There has been a change for the better in this portion of the village, from filling in with dry soil, etc.

So much for the condition of the different portions of our village during the years 1878–79, but how much these conditions contributed toward causing diphtheria I am not able to say.

Sanitary state of cellars, wells, privies, cess-pools, chip-yards and other surroundings of houses. — The cellars in certain portions of the village are in a bad sanitary state from the fact that they have no opportunity of draining except into the street, which is not practical, unless a common sewer can be furnished into which individual drains may empty.

The wells in certain portions of the town are surrounded by privy vaults, within a few feet, and as the vaults are not water tight the

soil becomes saturated, the fluid contents of privy vaults filter through the soil and into the wells and the water becomes contaminated and unfit for use, as I will show hereafter.

It has been the custom, and is still practiced, whenever the privy vault becomes filled, to remove the privy and dig a new vault and cover over the old one. One citizen, who has only a small lot, said to me, "I tried to find a spot for my privy, and dug down five different times and each successive attempt struck an old, filled-up vault;" *in the midst of these he has a well!* What can we expect from soil so thoroughly saturated for years with filth! and there are fifty such vaults to the acre, with accumulations of half a century. Very many of the privy vaults were in bad condition during the epidemic.

Only a few cess-pools are used in Geneva, and the majority of those are well taken care of, I think; cleaned two or three times a year, and now used in connection with drainage and the water-works.

I have no knowledge of any complaints arising from chip-yards, etc., but frequent complaints are entered from hog-pens, which are allowed within the corporation (but not within 200 feet of any residence), also from the stabling of cows, storing of super phosphates, guano and other fertilizers, all of which have been, and are still, allowed in the village corporation.

In looking over our records I find quite a number of cases of scarlatina reported from the first of May to September, 1878, and a few cases during the fall of 1879. Croup did not prevail to any extent. Two cases of diphtheritic laryngitis proved fatal in one family where three were sick during the epidemic, October, 1878. These children were subject to croup.

The number of deaths by diphtheria.—I here give the report of mortality, as arranged in September, 1879, which will include all cases reported from May 18, 1878, to September, 1879. Other cases occurred after September, 1879, but the ratio of deaths, etc., would probably remain the same.

Number of cases reported from May, 1878, to September, 1879,	448
Number of deaths from May, 1878, to September, 1879	80
Percentage of deaths	.17+

Of the 448 cases reported, 373 were of persons who used well water.

The families in three hundred and seventy-three cases used well water and had sixty deaths; the families in sixty-three cases used "White Spring" water and had twelve deaths; the families in three cases used filtered rain water and had three deaths; the families in nine cases used boiled well water and had five deaths; total, eighty deaths.

As regards the question of drainage, we have the following: Of the 448 cases reported —

308 occurred where there were no drains,	52 deaths,	17+	per cent.
128 occurred where there were drains without traps	22 "	17.4	"
12 occurred where there were water-closets in house with traps	6 "	50	"
Total	80 deaths.		

Number of deaths under 4 years of age	24
Number of deaths under 7 and over 4	16
Number of deaths under 10 and over 7	12
Number of deaths under 14 and over 10	17
Number of deaths under 16 and over 14	5
Number of deaths over 16	6
Total	80

Our village is supplied in part by the "White Spring" water, furnished by the Geneva Water Company, which has always been considered very excellent water. During the epidemic of diphtheria, many causes were given for the prevalence of the disease and among the most prominent was, that it had its origin in impure water.

Accordingly Prof. Breneman, of Cornell University, made a careful investigation of this question, and I am indebted to him for the following facts, and also to Prof. Z. H. Potter, of Cornell University, who resides here, and who aided in compiling facts in relation to the different analyses.

In selecting waters for analysis they were chosen from localities where diphtheria had prevailed, because it was hoped that the analysis might lead, if possible, to a discovery, at least, of the conditions favorable to the existence of that fearful disease.

Two careful qualitative and quantitative analyses were made of the White Spring water, the constituents of which are as follows:

"White Spring" Water, grains per gallon.

Chlorine.	Ammonia.		Nitrates.	Solid matter.
	Free.	Albuminoid.		
.25	.03	.044	Trace	22.3
.35	.03	.043	"	22.3

This was pronounced excellent water for drinking purposes. An improvement perhaps would be to make the water soft, which could be readily done by adding lime, thereby liberating the carbonic acid from the carbonate of lime which the water holds in solution and which renders it hard. This might be accomplished by means of an additional reservoir where the lime could be added before the water is distributed to the public.

Now permit me to call your attention to an analysis of the water

from the well on the premises of the lamented Dr. C. H. Carpenter, but allow me to add that Dr. Carpenter did not use this water, but drank filtered cistern water. The following is the analysis:

Dr. C. H. Carpenter's well, grains per gallon.

Chlorine.	Ammonia. Free.	Ammonia. Alb.	Nitrates.	Solid matter.
11.74	.773	.285	Very strong	95.

On the premises of Henry King, next door east of Dr. Carpenter's, is a well whose water is freely used for drinking, and is unfit to use; the analysis of this water is as follows:

Mr. King's well, grains per gallon.

Chlorine.	Ammonia. Free.	Ammonia. Alb.	Nitrates.	Solid matter.
7.08	0.86	0.55	Very strong	73.9

Besides being rich in nitric acid and chlorine the water of these two wells contains .285 and .555 grains of albuminoid ammonia per gallon, 1 grain of which is regarded by sanitarians as the limit of safety in all cases. Albuminoid ammonia is regarded as the most dangerous agent in all impure waters, for it appears to help carry the germs of typhoid fever and other zymotic diseases into the system. The free ammonia conveys into the air some of the less volatile products of putrefaction. If a well water contains such constituents what must be the sanitary conditions surrounding the locality from which such water is derived as well as of the air about and above such locality?

The water from the public pump on the corner of Main and Castle streets, at Mr. Gasper's, gives the following analysis:

Gasper's well, grains per gallon.

Chlorine.	Ammonia. Free.	Ammonia. Alb.	Nitrates.
17.34	.06	.115	Very strong.

By comparing this analysis with those before presented it will be seen that the impurities are very high, and this must be regarded as a dangerous water. (The well is not filled up, 1880.)

The water from the well in the yard of the Union School gives the following analysis:

Union School well, grains per gallon.

Chlorine.	Ammonia. Free.	Ammonia. Alb.	Nitrates.	Solid matter.
5.7	.02	.075	Strong traces	.44

Save in the item of chlorine this water is not bad, but if it be good to-day, it may be bad to-morrow; for the well water of all old towns is liable to become impure at any time.

The water from the Cortland Street School gives the following analysis:

Cortland Street School, grains per gallon.

Chlorine.	Ammonia.		Nitrates.
	Free.	Alb.	
65	.029	.11	None.

This water contains too much albuminoid ammonia, and I should suggest that its use be abandoned, or it be filtered before drinking.

The water of the well at Mr. J. C. Smith's on Washington street, just east of the cemetery, gives the following analysis:

J. C. Smith's well, grains per gallon.

Chlorine.	Ammonia.		Nitrates.
	Free.	Alb.	
4.25	.065	.135	Very strong.

It will be seen that this water contains so much albuminoid ammonia as to render it dangerous. It should at least be filtered.

We present a table of the amount of chlorine per gallon, in a number of well waters including that of the White Spring, in order to show the distribution of chlorine in the soil of the village. We also give in comparison the average amount of chlorine per gallon in 50 samples of English sewage taken from the sewers of sixteen towns where water-closets are in general use.

Chlorine.	
26.9	Well by the lake, south of Franklin House.
11.74	Castle street, east.
17.34	Corner of Castle and Main streets.
7.08	Castle street.
7.95	Main street, south.
5.7	Union school.
4.25	Washington street, west.
3.07	Washington street, further west.
.65	Cortland Street School.
.35	White Spring.
10.66	Average of 50 samples of English *sewage* from 16 towns.

The sanitary topography of Geneva.— Let us make a broader generalization from the facts presented. First then, why is there so much diversity in the character of the waters found within so small an area? Does the geological formation in and about Geneva contain in itself nitric acid, chlorine and albuminoid ammonia?

Geneva is situated on a heavy clay, beneath which lies a coarse water-bearing gravel. Under such circumstances, if there be no constancy in the character of the water obtained from adjacent wells its impurities must spring from local causes, and if from local causes, then from old or recent impurities. Old impurities formed by processes constantly in operation are found in the soil of all long-settled cities

and towns, and grave doubts arise under such circumstances as to the possibility of obtaining good water from wells in such localities.

Sanitary precautions adopted or neglected. — I herewith give copies of rules and regulations of the Board of Health from April 8, 1878, as adopted and distributed during the epidemic as the judgment of the Board directed.

Castle creek was lined three times during the summer and fall, and I do not think the Board neglected any sanitary measure which they were able to enforce. Cemetery creek was flooded in November, 1878, with White Spring water.

Attempts to prevent the spread of the disease. — An effort was made to control the commingling and crowding of children together, as shown by ordinance of May 28, 1878, as seen upon the next page.

Respectfully,

N. B. COVERT, M. D.

SANITARY RULES AND REGULATIONS OF THE VILLAGE OF GENEVA.

GENEVA, *April* 8, 1878.

Meeting of the Board of Health — Present: E. M. Maynard, *President.* Also, Messrs. S. H. Parker, H. R. Clark, M. D., Geo. M. Hemiup, C. H. Carpenter, *Health Officers;* C. P. Waters, *Inspector*, and W. G. Durrant.

The minutes of the last meeting were read and approved.

The Committee on Rules and Regulations presented the following report which was, on motion, accepted:

(1.) No person shall, between the 1st day of May and the 1st day of November next, slaughter or kill for market any cattle, sheep, swine or other animals within the bounds of the corporation, nor shall use or occupy any slaughter-house, building, or any other place within said bounds, for trying tallow, fat or lard, without the special permission of the Board of Health.

(2.) No vegetable, animal, or other offensive matter shall be thrown or deposited in any of the gutters, streets, lanes, alleys, vacant lots or public parks of the village, or into Seneca lake, or canal, within the bounds of said village.

(3.) Every place where swine or other animals are kept shall be thoroughly cleansed every day, and the manure closely piled and lined, and every kitchen drain shall be thoroughly disinfected at least once in each week, and every privy vault and cess-pool at least twice in each week, from the 1st day of May until the 1st day of November next. No swine shall be kept or penned within 200 feet of any dwelling.

(4.) Every person owning, occupying or using any premises in said village is hereby ordered to abate and remove all nuisances from such premises, and to cleanse and purify every out-house, privy vault, kitchen or other drain, hog-pen, barn yard or other place situated or belonging or appertaining to such premises before the 1st day of May next, and from time to time thereafter, until the 1st day of

November next, as may be necessary to prevent the same from being offensive and detrimental to the public health; and to abate any nuisance in such manner and at such time as any of this board may direct.

(5.) All cases of scarlet fever, diphtheria, measles, erysipelas, varioloid and small-pox shall be immediately reported in writing to the President of said Board of Health, or to the health officer of the Board, by both the attending physician and the head of the family, stating in said report the disease, name of patient and the street and number of his or her residence.

(6.) Any person or persons, bringing or aiding in bringing within the corporate limits of the village of Geneva, without authority from the President of the Board of Health of said village, the body, clothing or bedding of any person who died of any contagious or infectious disease, shall be punished for a misdemeanor, according to section 2 of chapter 790, Laws of 1867.

Every person who shall willfully violate or refuse to obey any order or regulation so made and published, or any order so made and served or posted as aforesaid, shall be deemed guilty of a misdemeanor, and on conviction thereof shall be subject to a fine or imprisonment, or both, in the discretion of the court; such fine not to exceed one thousand dollars, nor such imprisonment, one year.

At a meeting of the Board, May 28, 1878, the following ordinance was, on motion, adopted and ordered to be published in the village papers:

Resolved, that every family in which any contagious or infectious disease may occur in this village shall hereafter, during the time such disease exists in said family, restrain as far as possible their children from intercourse with other children in the neighborhood, and shall not permit them to attend school or any public assembly, until all danger of contagion has passed.

Any person violating the foregoing regulation shall be subject to a penalty of twenty-five dollars.

Orders and Regulations of the Board of Health.

At a meeting of the Board of Health of the village of Geneva, held October 14, 1878, the following orders and regulations were made by said Board and ordered published in the Geneva *Gazette* and the Geneva *Courier*, and a copy thereof left by the attending physician in every family where a case of scarlet fever or diphtheria is under his care or treatment:

"The body of every person who has died of diphtheria or scarlet fever shall be immediately inclosed in an air-tight coffin or burial case, which coffin or case shall not be opened thereafter; and the interment of the body shall be made within thirty hours after death.

"No person shall enter any house where there is a case of diphtheria or scarlet fever, unless invited for the purpose of assistance, until the safety of such visit shall be assured by the attending physician;

and no visit shall be made after death, except as aforesaid, until the body is encased for burial, as required by the foregoing order of the Board.

"Any person who shall willfully violate or refuse to obey either of the foregoing orders shall be deemed guilty of misdemeanor, and shall be subject to the penalty prescribed by law. (Sec. 2, chap. 790, Laws of 1867.)

"By order of the Board."

Bulletin of the Board of Health.

At a regular meeting of the Board of Health, held Monday evening, December 2, most of the physicians of Geneva were present by invitation, from whom suggestions were solicited relating to the improvement of the sanitary condition of the village. As a result of such conference, the Board of Health promulgate the following

Recommendations:

"That every housekeeper fumigate his premises by burning tar, pitch, rosin, or sulphur, in yard or garden; also, rake up and remove or burn all decayed or decaying leaves, and all vegetables or animal matter; also to thoroughly disinfect all water-closets, cess-pools, kitchens and other drains, by a free and frequent use of carbolic acid, chloride of lime, copperas, or other effective disinfectant."

DYSENTERY ON LONG ISLAND.

The occurrence of house-epidemics of bowel diseases, especially if the disease is dysentery appearing suddenly, fatally and in only a few scattered dwellings, as was the case at Southampton, should incite to prompt inquiry. The following brief account of the sudden outbreak of dysentery in a few old homesteads in this little village, renowned for healthfulness, has been received from summer residents there who recognized the fatal relation of cess-pools, and other sources of excremental defilement, to the domestic wells.

[From Summer Residents at Southampton, L. I.]

To the State Board of Health:

Gentlemen — In view of the fact that, during the past two months, ten cases of dysentery have occurred in the village of Southampton, Long Island, with a mortality of two adults and one child, we, the undersigned, residents of that place, would respectfully request of your honorable body that an investigation into the causes of the disorder be made.

In conducting this investigation we would deem it a privilege to aid you in any way in our power. At the same time we would suggest, for fear of exaggerated reports concerning the matter, that as little publicity as possible be given to your action.

(Signed)

Salem H. Wales.	Edward S. Mead.
W. S. Hoyt.	U. A. Murdock.
Frederic H. Betts.	Leon D. DeBost.
C. Wyllys Betts.	C. S. Bull, M. D.
G. R. Schieffelin.	Jas. G. K. Duer.
W. H. Schieffelin.	Carl Pfeiffer.
Lewis D. Siebert.	P. Brynberg Porter, M. D.
A. H. Buck, M. D.	T. Gaillard Thomas, M. D.

Dated Southampton, L. I., *Aug.* 21, 1880.

P. S.—Since the above was written two additional cases have occurred.

A Brief Account of Dysentery as it prevailed and as it was investigated at Southampton, L. I., in 1880.

To the State Board of Health of New York:

The following report in regard to an outbreak which occurred at Southampton, Long Island, during the past summer, is fur-

nished in compliance with your request for the information and use of the State Board of Health:

On account of certain data which I hoped would be available in its preparation, but which are not yet in my possession, this report is not yet as complete as I could have desired; but enough facts have, I think, been collected to prove, with reasonable certainty, that the occurrence of the disease was due to wholly preventable causes, and to leave the Board in no doubt as to the kind of measures which it ought to suggest, and if possible enforce, in order that a repetition of the trouble may be avoided in the future.

During the past two summers I have spent some five months in the village of Southampton, engaged in the practice of medicine, and have, therefore, had considerable opportunity to become acquainted with the hygienic conditions prevailing there; but at the outset of my report it is only right that I should acknowledge my great indebtedness to the Secretary of the State Board of Health for valuable advice in regard to its preparation, and for kindly accompanying me to Southampton in the early part of October, for the purpose of making a personal examination of the premises of the families in which the dysentery occurred.

The portion of Long Island in which the village is situated has always enjoyed the reputation of extreme healthfulness, which is, indeed, abundantly confirmed by statistics prepared with much care by physicians of the Island; and this is, no doubt, to a great extent, the reason why with each year it has become the summer resort of increasing numbers from the city. The advantages and characteristics of Southampton in this respect, as well as certain dangers to which it is exposed, cannot perhaps be better stated than in the following letter on the subject which I have received from Dr. Albert H. Buck, of New York, who for quite a long period has made it the residence of his family for at least five months out of the year:

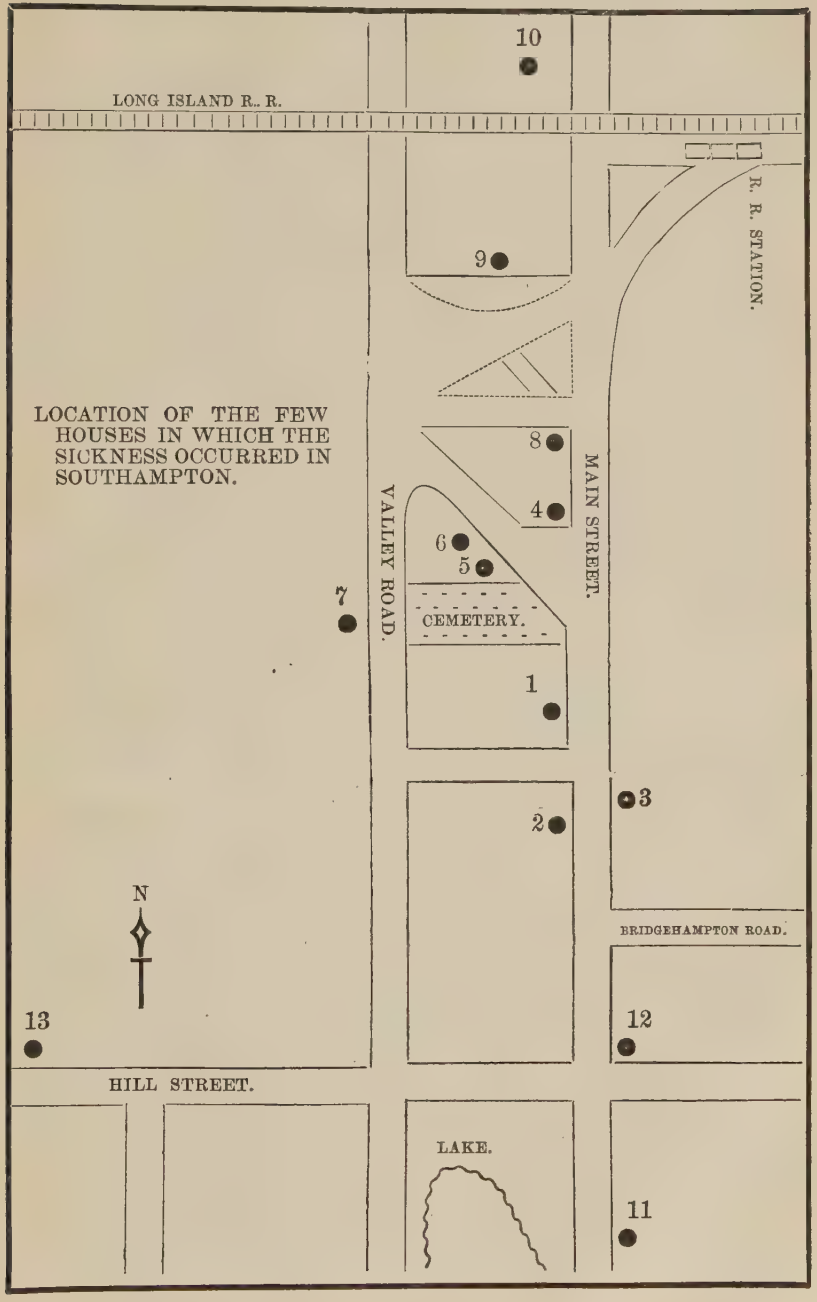
"I have always considered Southampton a remarkably healthy place. The greater part of the time the wind blows from the ocean toward the land, and, consequently, the inhabitants of that region are supplied, the greater part of the time, with an air as pure as that which can be found anywhere in the world. So far as the air is concerned, therefore, we have only to consider to what degree it may become contaminated by injurious local emanations. I can think of only one possible source of ærial contamination, and that is the "town pond." There are no swamps near Southampton, and there are no foul collections of refuse, of any size, on the surface of the ground. There are, however, at times, masses of decaying vegetation on the surface of the "town pond," and these masses are sometimes so considerable that some injurious influence may very well spread from them to the general atmosphere lying immediately over and around the pond. This body of water, which is fed by numerous springs, and which, furthermore, is simply an exposed portion of that great subsoil lake which stretches from one end of Long Island to the other, is filled with a profuse growth of living vegeta-

tion. This living vegetation purifies the water, and is, therefore, *per se*, unobjectionable; but the center-boards of our sail-boats and, to a lesser degree, the oars of our row-boats are incessantly busy in tearing up these weeds. They rise to the surface, are blown by the wind into sheltered places along the shore, there rot on the surface of the water, and give forth emanations which can easily be recognized by the sense of smell. These emanations *may* contaminate the air; otherwise, the lake is, I believe, perfectly harmless. Although it has no visible outlet, it has an invisible one (through the sandy beach) which answers all the practical purposes of an outlet. I am familiar with the drainage and cess-pool arrangements of the different cottages in the immediate vicinity of the lake, and I do not know of a single instance in which refuse matters are allowed to flow into this mass of water or into the soil along its shores.

"So far, then, as the air of Southampton is concerned, I know of no sources of contamination beyond those which I have mentioned, and which may readily be remedied. The porous soil of Southampton, and the almost entire absence of non-porous strata of clay, have a great deal to do, I believe, with the healthfulness of the place. There is probably not a house in the village which is built on ground the surface of which is nearer to that of the subsoil water than six feet. Quite near the ocean, where one or two of the cottages have been built, the interval may, indeed, be only three feet; but these cottages are built on piers, at least two feet above the ground, and with the sides fully exposed to the currents of the air. These conditions of soil, which are so unfavorable to malaria and to rheumatic affections, are, however, eminently favorable to the contamination of the sources of drinking water, commonly employed at Southampton. Here, I think, lies the great danger to the lives and health of those who spend their summers there, or at any other village on the south side of Long Island."

So long as the houses are occupied by only five or six human beings, the chances of serious contamination are not very great; but when the population is quadrupled or quintupled, as it is during July and August, the danger of contamination from privies, such as are universally employed in Southampton, and other small towns or villages, is so great that we can safely predict a prevalence of diarrhœa and dysenteric affections, or of something worse (typhoid fever). If every visitor would engage his board and room only on condition that the pail system (or some similar plan) should be adopted, the desired cure of existing evils would speedily be accomplished. In a minor degree the careless disposal of slops and garbage may exert a contaminating influence upon the drinking water. The privy system, however, is undoubtedly the chief source of danger." The "town pond" mentioned by Dr. Buck is a fresh-water lake, nearly a mile in length, extending north and south, from near the center of the village to within a few rods of the ocean.

PART OF SOUTHAMPTON VILLAGE.



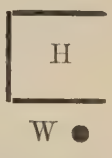
As will be seen from what follows, we have, then, the history of a well-defined, although not wide-spread, house-epidemic of dysentery occurring in a village whose locality (as its past history proves, and as one would certainly infer from the conditions stated in the above communication) is naturally one of the most salubrious that it is possible to imagine, and yet whose soil is just of such a character as to permit the poisoning of wells by a local defilement whenever circumstances arise which are favorable to such a contamination. The investigation which has been made of the premises belonging to the different houses in which the disease occurred has in almost every instance demonstrated the very strong probability of its origin in contaminated drinking water, and a reference to the meteorological conditions which prevailed during the season adds such striking confirmation to this supposition as to carry positive conviction to the mind of any one who is familiar with the subject of house-drainage and water supply. I had expected to embody in this report careful meteorological records for the months of April, May, June, July and August, 1880, in the region of Long Island, where Southampton is situated, but these, unfortunately, have not yet been received. It is however, the unanimous testimony of a number of careful observers in the village, with whom I have conversed on the subject, that during the months of May and June a very severe drought prevailed, while in the early part of July there were heavy rains, which recurred also later in the month. Now this occurrence of sudden and excessive rain-fall succeeding a more or less prolonged season of drought, constitutes precisely the condition which, in the opinion of the best authorities, is most liable to occasion a washing of organic matters from cess-pools and privy-wells into the surrounding soil; whence, if the latter is sufficiently porous, they are very likely to wash their way into the drinking water, even when the well is at a considerable distance from the primary source of contamination.

In order that the location of the houses in which dysentery occurred may be better understood, I have prepared the accompanying rough diagram of a considerable portion of the village; in which the position of every house where a case of it is known to have existed is represented with sufficient accuracy for all practical purposes. The numbers marked thereon do not, however, indicate the chronological order in which the cases appeared, with the exception of number one, which designates the house where the first case occurred.

The first heavy rain of the season occurred on the 5th of July, and the first case of dysentery made its appearance on the 9th. The patient was a lad about thirteen years of age, and medical aid was summoned for him on the 10th. His parents attributed the origin of the attack to the fact that he had gone in bathing while overheated, and remained in the water for an hour; but none of the boys who went bathing with him had dysentery. About the time of his illness two of his brothers suffered from diarrhœa, but the lat-

ter does not seem to have been very severe. A careful examination of the premises reveals the following facts.*

Premises No. 1.



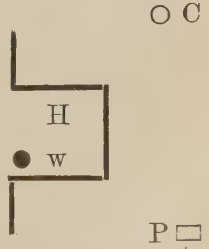
The dwelling stands below the level of the railway station (which is about 25 feet above tide), four (4) feet. The ground slopes in a southwesterly direction. The privy-floor is three (3) feet below the level of the house, and two (2) feet below the level of the top of the well. The bottom of the well is twenty (20) feet below the privy-floor. Distance of the privy-vault from the house, thirty-six (36) feet. Distance of the privy-vault from the well, sixty (60) feet. Distance of the well from the house, ten (10) feet. The water in the well is low, being about three and a half or four feet deep. The surface-soil is about three and a half feet deep.

Premises No. 2.

The patient in this house was a child of two and a half years, and the attack rapidly proved fatal.

Estimated level of the dwelling below that of the railway station, four (4) feet. The ground slopes in a westerly direction. The well is situated in the house, and the distance of the privy-floor below the top of the well is one (1) foot. Distance of the privy-floor below the house-floor, two (2) feet. The bottom of the well is twenty-one (21) feet below the privy-floor. Distance of privy from house, forty-six (46) feet. Distance of privy from well, fifty-six (56) feet. The soil is three and a half ($3\frac{1}{2}$) feet deep, and consists of a strong loam.

Premises No. 3.



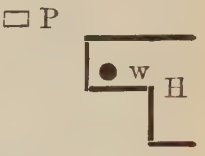
This dwelling is a large boarding-house, and the patient who suffered from dysentery was a young lady from New York, about sixteen years of age. This was a very severe case, characterized by an unusually high degree of temperature, and the patient's life was saved with difficulty. It was more than three months before she recovered her strength. There was at least one other case of bowel-trouble (diarrhœa) in the house.

Estimated level of dwelling below that of the railway station, four (4) feet. The ground slopes in a north-easterly direction. Distance of privy-floor below the house-floor, two (2) feet. Distance of privy-

* In this and all the other cases the measurements were taken with great care by Mr. James H. Pierson, assisted by Captain George G. White, both of Southampton, who very kindly undertook this duty. In the various diagrams, H represents the house, W the well, C the cess-pool, and P the privy.

floor below the top of the well (which is situated within the house), one (1) foot. Distance of the bottom to the well below the surface of the ground at the privy twenty (20) feet. Distance of the privy from the house, eighty-two (82) feet. Distance of the privy from the well, ninety-six (96) feet. Distance of the cess-pool from the well, sixty-three (63) feet. The surface-soil is about three and a half ($3\frac{1}{2}$) feet deep, and consists of a strong loam.

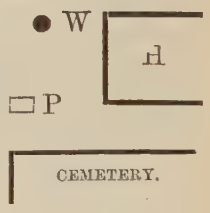
Premises No. 4.



The case in this house was fatal; the patient being an old lady sixty-seven years of age, who had been suffering from other troubles for some time.

Estimated level of dwelling below that of the railway station, four (4) feet. The ground slopes in a westerly direction. Distance of privy-floor below the level of the house-floor, four (4) feet. Distance of privy-floor below level of top of well, two (2) feet. Distance of the bottom of the well below privy, seventeen (17) feet. Distance of the privy from the well (which is in the house), forty-four (44) feet. The well, like all the others in the vicinity, has been low all summer, and still remains so. The surface-soil is two (2) feet deep, consisting of a sandy loam.

Premises No. 5.



The case in this house was one of the later ones of the outbreak; the patient being taken on the 9th of August. She was an unmarried lady, about twenty-five years of age, and had been more or less in attendance, during her dysenteric attack, on the old lady who died on premises number four. There does not seem to have been any unusual features in this case (which was of considerable severity), and there were no other cases of disease in the house. It is interesting, however, to note the proximity of the premises to the village cemetery.

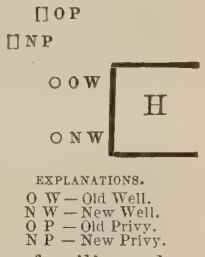
Estimated level of dwelling below that of the railway station, eight (8) feet. The ground slopes toward the west, and the soil is a sandy loam. Distance of privy-floor below the level of the house-floor, two (2) feet. Distance of privy-floor below level of top of well, one (1) foot. Distance of bottom of well below privy-floor, fifteen (15) feet. The water in the well has been low all summer, and is about two (2) feet deep. The well is open. Distance of privy from house, thirty-eight (38) feet. Distance of privy from well, thirty-one (31) feet. Distance of well from house, seven (7) feet. Distance of well from cemetery (which lies south of, and drains toward it), thirty (30) feet.

Premises No. 6.

In this house, which was occupied by a very respectable negro family, there were two cases of dysentery. The first patient was a boy eight years old, and the attack was supposed to have been brought on by eating green apples. It began in the early part of August, and was acute for one week, when he began to be convalescent. As soon as he recovered, the mother was taken down with the disease. There is no well on the premises, and the family are in the habit of drinking the water from house number four, where the old lady died.

The dwelling is about eight (8) feet below the level of the railway station, and the ground slopes in a south-westerly direction. Distance of privy-vault from house, fifty-five (55) feet. Distance of privy-floor below the house-floor, about one (1) foot. The soil is from one and a half ($1\frac{1}{2}$) to two (2) feet deep, and is a sandy loam.

Premises No. 7.



In this house occurred a very interesting and instructive group of cases. The dwelling is occupied by two families, and every child had dysentery. For a long time, it is stated, the well-water had been foul, but after the heavy rains of July 5th and the succeeding days, it became extremely bad. The inmates describe it as being covered with a green scum, and having a disagreeable odor. When it was boiled they say that it "turned red." Soon after the above date the only child of one of the families, a boy two years and four months old, was taken with dysentery, and the physician who was called to attend him condemned the water of the well as unfit for use. It was a well-marked case; but the child recovered. Very soon after the commencement of the attack the oldest child of the second family, a boy of eleven years, was seized with the disease. He was ill for over a week, and recovered. About the last week in July the youngest child, two years and two months old, was taken, and on the 23d of August died. During this period the second child, a boy five years of age, was attacked, and had bloody discharges for two days; but in this case the disease yielded promptly to treatment, and the child made a rapid recovery. On the day that the youngest child died a new well was dug; but it is stated that at the present time the water in this is scarcely better than was that in the old well, which was at once filled up. There has been no sickness, however, in the house since. The use of the old privy, which is marked in the accompanying diagram, was discontinued about a year before the new well was dug.

Dwelling about three (3) feet below level of railway station. The ground slopes toward the east. Privy-floor four (4) feet above house-floor. Privy-floor two (2) feet above level of top of well. Bottom of well twenty-two (22) feet below level of privy-floor. Distance of

privy from house, seventy-two (72) feet. Distance of privy from old well, sixty (60) feet. Distance of privy from new well, sixty-three (63) feet. Distance of new well from old, fifteen (15) feet. Distance of old privy from old well, forty (40) feet. There is no cess-pool, and the kitchen-slops and other refuse material have been allowed to run over the surface of the ground. The soil is a sandy loam, — from one to two feet deep, — with coarse sand beneath.

Premises No. 8.

In this house there was one case, which was of marked severity, but it was followed by recovery. The patient was a young girl — age not ascertained — and her illness occurred during August.

Dwelling about four (4) feet below level of railway station. The ground slopes toward the west. The privy-floor is about on a level with that of the house. The bottom of the well is nineteen (19) feet below the surface of the ground. The well is in the house, and open. The water in it is low — two (2) feet deep. Distance of well from privy, thirty (30) feet. The surface-soil is two and a half ($2\frac{1}{2}$) feet deep, and consists of a sandy loam.

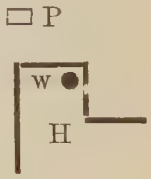
Premises No. 9.

In this house a young lady from New York, nineteen years of age, who had previously been in delicate health, died of acute bilious dysentery; her illness lasting from the 5th to the 12th of August. There were also in the family three cases of diarrhœa, two of them quite severe.

Dwelling about four (4) feet below level of railway station. The ground slopes toward the south. Elevation of privy-floor above house-floor, two (2) feet. Distance of privy-floor above surface at well, three and a half ($3\frac{1}{2}$) feet; well in the house. Distance of bottom of well below level of privy-floor, twenty-five (25) feet. Distance of privy-vault from rear of house, thirty-six (36) feet. Distance of privy from well, fifty-four (54) feet. The surface-soil, which is a sandy loam, is one and a half ($1\frac{1}{2}$) feet deep.

Premises No. 10.

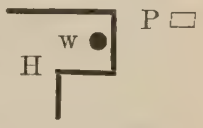
The case which occurred in this house was the last one of dysentery that occurred in the village, so far as is known. The patient, who was a lad fifteen years of age, was taken the latter part of August, and was ill for three weeks. He suffered from diarrhœa (which was attributed at the time to the eating of green apples) for some time before the dysenteric symptoms set in.



The dwelling is about on a level with the railway station. The

ground slopes toward the south-east. The well, which is in the house, is a driven one, and the distance to water is about twenty-six (26) feet. The privy is thirty-three (33) feet from the nearest portion of the house, and forty-two (42) feet from the well. The privy-floor is three (3) feet above the house-floor, and four (4) feet above the surface at the well. The surface-soil is about one and a half ($1\frac{1}{2}$) feet deep, and is a sandy loam.

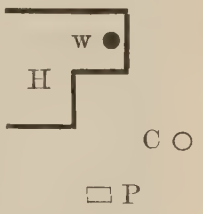
Premises No. 11.



In this house the patient was a young lady about eighteen, a native of Southampton. The attack was a very severe one, and she was ill a long time.

Dwelling about on a level with the railway station. The ground slopes toward the west. Distance of privy from well, about fifty (50) feet. The soil is a strong loam, three or four feet deep.

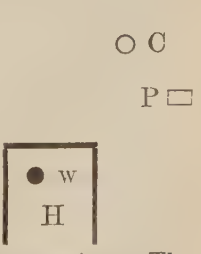
Premises No. 12.



The dwelling is a large boarding-house. There was one case of dysentery in it, and this occurred about the middle of July; the patient being a lady from New York about fifty years of age. The symptoms were well-marked at first, but yielded at once to treatment, so that she recovered quickly, although considerably weakened by the attack. There were at least three cases of diarrhœa during the summer.

Dwelling about on a level with railway station. The ground slopes toward the south-east. Distance of privy-floor below house-floor, one (1) foot. The bottom of the well, which is in the house, is twenty-five (25) feet below the privy-floor. Depth of water in the well, four (4) feet. Distance of privy from nearest part of house, forty-eight (48) feet. Distance of privy from well, sixty-eight (68) feet. Distance of cess-pool from well, forty (40) feet. The soil is about four feet deep, consisting of a strong loam.

Premises No. 13.



The only person who suffered from dysentery in this house (which is also a boarding-house) was the cook, who was quite an elderly woman. She was taken sick about the 12th of July, and during her illness was sent to her home at Moriches, Long Island, where she recovered. There were at least two cases of diarrhœa in the house, one of them quite severe.

The dwelling is about on a level with the railway station. The ground slopes in a south-easterly direction. The privy-floor is one

(1) foot lower than the top of the well, and one and a half (1½) feet lower than the house-floor. The well is in the house, and contains three (3) feet of water. The distance to water is twenty-eight (28) feet. The bottom of the well is twenty-seven (27) feet below the privy-floor. Distance of privy from house, fifty (50) feet. Distance of privy from well, sixty (60) feet. The surface-soil is a strong loam, about four (4) feet deep. The kitchen refuse runs to the cess-pool, over one hundred (100) feet distant, through a drain-pipe under ground.

It will thus be seen that from the 9th of July to the 1st of September there were seventeen known cases of dysentery occurring in thirteen different houses, and that of these four proved fatal. No case is known to have occurred after the first of September. On account of the extreme permeability of the soil at Southampton, it is not difficult to see how dysentery might easily be caused by pollution of well-water in any one of the premises which have been described in the preceding pages; but in some of them the conditions are so peculiarly favorable to such pollution that the wonder is that the disease did not attack a much greater number of individuals and was not far more fatal in its effects. Take, for instance, premises number ten, where the last case occurred, premises number nine, where the young lady from New York died, and premises number seven, where there were four cases, with one death. In the first, the floor of the privy, which is only forty-two feet distant from the well, is four feet above the top of the latter, while the ground slopes directly from the privy toward the well; and the general state of affairs is precisely the same at the others.

In regard to the character of the soil, I am informed by Mr. Pierson, who took the measurements given above, and, being a life-long resident of Southampton, is perfectly familiar with the matter, that all the surface-soil north of premises number one is a light sandy loam, not over two feet in depth, and often less. South of this point there is a stronger loam, from two to four feet deep, and there are occasional veins or pockets where the loam is much deeper; but these are not frequent, and of small extent when they do occur. Below the loam there is nothing but sand, and he states that he knows of no layers of clay or hard-pan in the vicinity, which might divert drainage from a direct downward course. All the wells in Southampton are very low this season, and Mr. Pierson furthermore informs me, in answer to an inquiry upon the subject, that he cannot find any one who has observed a sudden rise of water after severe storms. The effect, if any, is so slight as to be unnoticed; which is, no doubt, to be attributed to the unusual porosity of the soil. Those laborers who work upon wells and pumps, and are careful observers, say that about eighteen inches is the extreme difference in rise and fall of water in the wells, and that this does not occur every year, but at intervals of several years.

As to the territory invaded by the disease, it is worth while to note that ten out of the thirteen houses where dysentery occurred

are clustered comparatively closely together, and that they are situated, to a certain extent, along the course of a shallow valley extending north and south and terminating in the lake-basin. The essential features which would serve to demand attention in a study of this outbreak are three: Its brief duration, the limited number and special location of the houses affected, the extreme liability of the drinking-water to contamination from the relations of the wells to the sources of cloacal defilement, and the prolonged drought of the early part of the season, followed by the heavy rain-fall on July 5th and during a considerable part of the month, which furnish the ordinary conditions for such defilement and for the disease which results therefrom.

The occurrence of such endemics, which involve an utterly unnecessary sacrifice of human life, to say nothing of the suffering and loss of time they entail, is unfortunately only too common, and especially at the sea-shore. That at Babylon, during the summer of 1879, is already fresh in the minds of many, and numbers of others might be cited. In this connection it may, perhaps, be well to quote the brief account of Ocean Grove, New Jersey, which Dr. Hartshorne, late Professor of Hygiene in the University of Pennsylvania, gives in the little volume, entitled "Our Homes," recently published in the series of "American Health Primers." "During the first two or three years of its settlement," he says, "driven wells for drinking-water, and other wells for house-wastes, were dug side by side, on small lots, not many feet apart. The sandy ground permitted an easy mingling of waste and water-supply in the common ground-water of the place. As a consequence, almost every person who visited the locality went through a seasoning or acclimating diarrhœa, which, especially with young children, involved sometimes quite a serious illness. Fortunately, the Ocean Grove Association, becoming aware of the increasing contamination of their ground, took judicious measures for its protection. All waste-wells were made (as nearly as possible) water-tight; and, under strict regulation, they were all periodically cleaned out at sufficiently short intervals to avoid atmospheric contamination. A resident of the place informed me that the local diarrhœa at once disappeared under these appropriate improvements. Other watering-places have been known to suffer great disadvantage from analogous defects, not always ascertained until after they have cost some lives of visitors who had sought them as sanctuaries of health."

Before closing, I ought not to neglect to mention that diarrhœal trouble was much more prevalent in Southampton during the past season than during the summer of 1879, when there was, so far as I am aware, little or none in the village. Certainly there was none whatever among the families from the city, or if there was, it was so slight as not to require medical aid. This year I was called upon to treat quite a number of cases, and three of them were of such an obstinate character that in spite of all measures that could be adopted for their relief the trouble still persisted; and it finally became necessary that the patients should go elsewhere before a cure could be

effected. At none of the houses, where these individuals were, was the sanitary condition of the premises especially faulty, as far as could be ascertained; but in all of them the drinking-water supply was open to the suspicion at least of contamination, from the nature of the surrounding soil and the character of the privy-vaults.

Even among some of the cottages near the shore of the lake, to which Dr. Buck alludes in his communication, where it is believed that every reasonable precaution has been taken to prevent contamination of the drinking water, there were a few cases of diarrhœa, though scarcely any of them were severe in character. Still it is a fact, however, that not a single case of dysentery occurred in any house at Southampton about whose premises the proper precautions had been adopted.

From the history and data which have thus been given, the one leading conclusion to be derived is, that there has been contamination of wells by means of human excrement, which has given rise to the existence of serious disease in a locality which is natually one of the most healthful in the world. If, now, this is thought to have been substantiated by the facts collected in this report, the only problem is, how such an occurrence is to be prevented in the future; and it remains for the State Board of Health to recommend, and, if possible, enforce, the adoption of such measures in Southampton as will effectually accomplish this object. In the carrying out of the good work I can state with confidence that the Board will receive cordial support from the more intelligent land-owners; but there may remain considerable opposition to be overcome among the ignorant and prejudiced.

Very respectfully,

P. BRYNBERG PORTER, M. D.

22 West Thirty-first street, New York, *November* 3, 1880.

Report of an outbreak of Dysentery at Babylon, L. I.

Early last summer, physicians practicing in Babylon and its vicinity gave information concerning an unexplained outbreak, and a very exceptional mode of prevalence, of dysentery in certain portions of that village during the previous autumn and winter.

Dr. Hewlett, a regular correspondent of the Board, communicated information which rendered it desirable to have the facts relating to this outbreak carefully investigated while the events at Southampton were under investigation.

These two villages, situated upon nearly the same levels of the sandy plains near to and but little elevated above tide-water, have for successive generations been renowned for their natural salubrity. Therefore the sudden and unlooked-for outbreak at Southampton, it was believed, might throw some light upon the causation of a similar but more obstinate kind of dysentery that had so recently prevailed in certain portions of Babylon. We present here so much of the records and investigation as has been satisfactorily completed. The

State Board of Health has ordered still further researches to be made in both localities, especially as respects the defilement of wells.

To the Secretary State Board of Health:

SIR — I have the honor to submit the following report. The accompanying map, drawn by Mr. Jonathan Sammis, of Babylon, comprises the principal territory that was invaded by the disease, its tidal outlines and water-courses, the elevation of various localities above tide-level, the location of each household in which the disease occurred, the relative elevation and distance of the privy-vault, cesspool, and well of each household, respectively, in twelve selected localities, also the localities of two households where dysentery was observed in 1880, and that of three dwellings where continued fevers occurred in 1880.

Localities where dysentery occurred in 1879 and 1880 are indicated by black outlines.

Area of mapped district comprises nearly.....	2,900	sq. acres.
Total population of mapped district.....	1,900	
Number of households in mapped district.....	331	
Number of households in which dysentery occurred in 1879, in mapped district.....	98	
Cases of dysentery in 1879 in mapped district..	182	
Deaths from dysentery in 1879 in mapped districts	16	

It is impossible to ascertain the precise date of the development of each case, or even the date of its occurrence in each household, as no definite record of cases was kept by the attending physicians. The numbers in black on the map are simply for convenience in referring to different households. Our surveyor made examinations and measurements at twelve households, the diagrams of which are drawn upon the margin of the map. He has also recorded thereon the results of his examinations, with diagrams, made at three other households (not numbered) in which no sickness of importance has occurred during the period here stated, in order to show their relations to the infected households.

The first case occurred July 6, 1879, at number 43, where six others were developed within the ensuing month. One of these cases, aged eighteen months, resulted fatally. About a week later the disease appeared at number 44, near the depot. It there affected successively a group of five persons, all within a period of about three weeks. Other cases appeared in the latter part of July at number 64, 68 and 70. Then for a period of two or three weeks the visitation was confined to a locality eastward and southward of the cemetery. At number 4 there were five cases and at number 5 there were five cases. During the middle and latter part of August a number of cases occurred in the central part of the village. In September and October the majority of the new cases occurred in the eastern and western portions of the southern side of the village. At number

23, there were six cases. In the eastern part at number 21, there were six cases. In the latter section there was scarcely a household in which one or more cases of dysentery did not occur. Bordering the east bank of this part of the village, extending northward as far as number 91, and westward a little beyond a line intersecting the bridge, is a layer of ferraginous clay, which lies at a depth of six or eight feet below the surface. Most of the families in that section use water from springs or old wells, and there the bottoms of all the privy vaults and cess-pools are above this water-bearing strata.* We have no evidence that this hard water-bearing table exists in any other portion of the inhabited part of the mapped territory.

During November and in the early part of December, the cases occurred in various parts of the mapped district. These were mainly individual cases. The last case was seen December 5, 1879. There were no intimate relations existing between the families in which the first series of cases occurred. At numbers 89 and 69, two cases of the second attack were observed. In addition to the above cases, there appeared 22 cases of dysentery in 1879, outside of the mapped district but within the post-office district. All of these cases recovered. Three of them were developed on the islands across the bay, which are situated six or eight miles from the mainland.

It was thought probable that the approach of colder weather put an end to the epidemic. In 1880, dysentery in the epidemic form occurred in the two households both situated within the mapped district. In neither house had the disease appeared in 1879. At one house (the parsonage) the disease first attacked, in April, two children who were slowly convalescing from a severe attack of measles. Within a period of ten days four other inmates of the same household were seized with dysentery. Two cases resulted fatally, —one of the children who had just had measles and had also convulsions, and a young lady, aged 17. No other case was observed until October, when one occurred in a house situated above the railroad, which is represented by a diagram in ochre color upon the map. A diagram of the parsonage is also represented, with well, cess-pool, etc., upon the right margin of the map.

Continued fever (enteric) was observed in three households in 1880. These were all exempt from dysentery in both years. There were no cases of continued fever in 1879.

The type of dysentery was of that character which is described in the books on "Epidemic Dysentery," and the majority of the cases were of the severer form of the disease.

No records of the ages of the patients were kept, but we believe that the patients were mainly persons in the extremes of life. Several nursing infants were among the number, also three persons who were upwards of seventy. During the latter part of summer and in early autumn, we observe several cases of the acute or sporadic form of dysentery in every year. In 1880 we have had fewer of

* The driven wells (see question number 4 in your letter of November 2d) here are below this hard pan, and so is at least one spring, but we believe that most of the sources of water supply are above it.

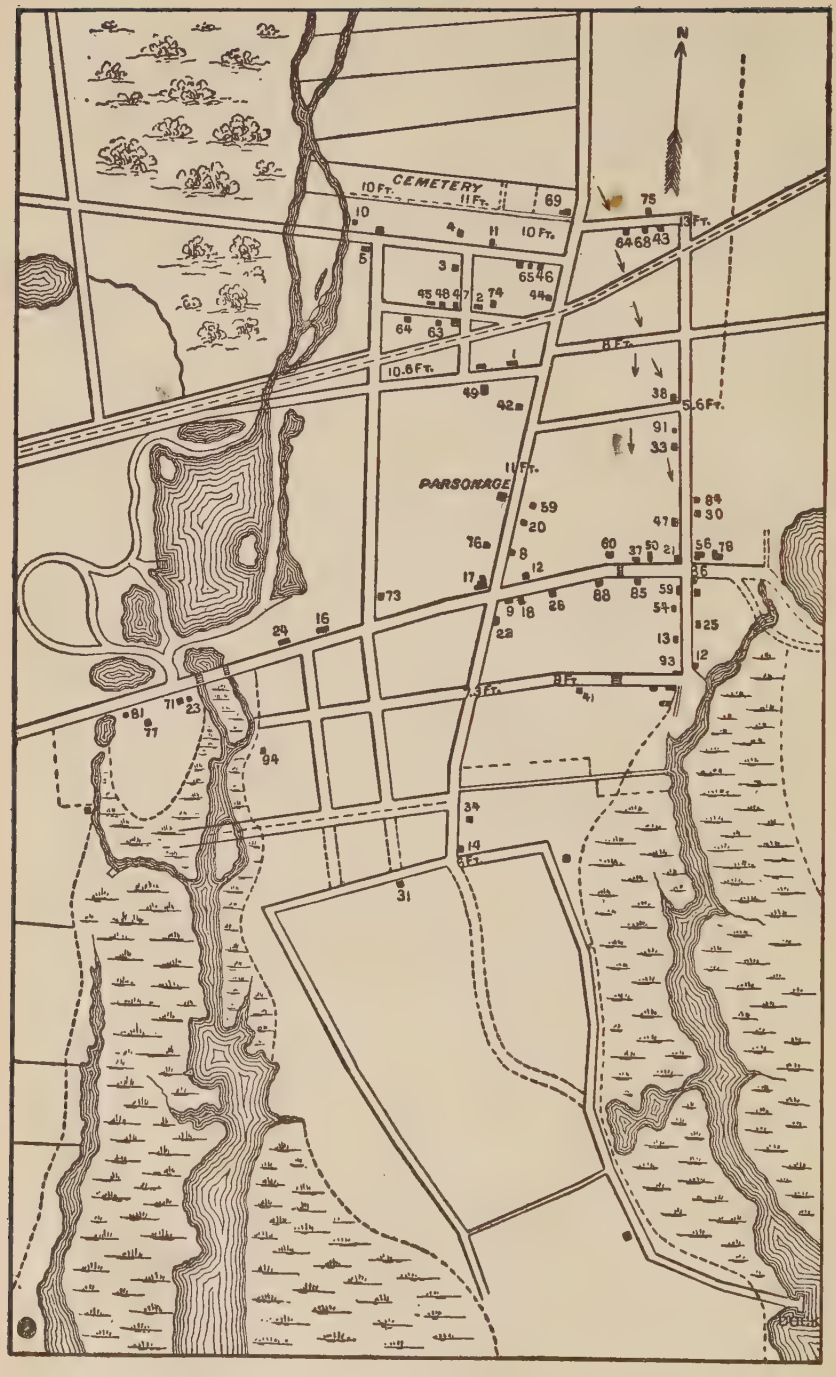
such cases than usual, and we are unable to account for the specific cause of the unprecedented visitation of dysentery in 1879.

I wish herein to express my obligations to Drs. Provost and Robinson for their kindness and courtesy in furnishing me with lists of their cases.

Respectfully submitted,

W. W. HEWLETT, M. D.

BABYLON, L. I., *November* 5, 1880.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CEMETERY
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11 Ft.
PARSONAGE
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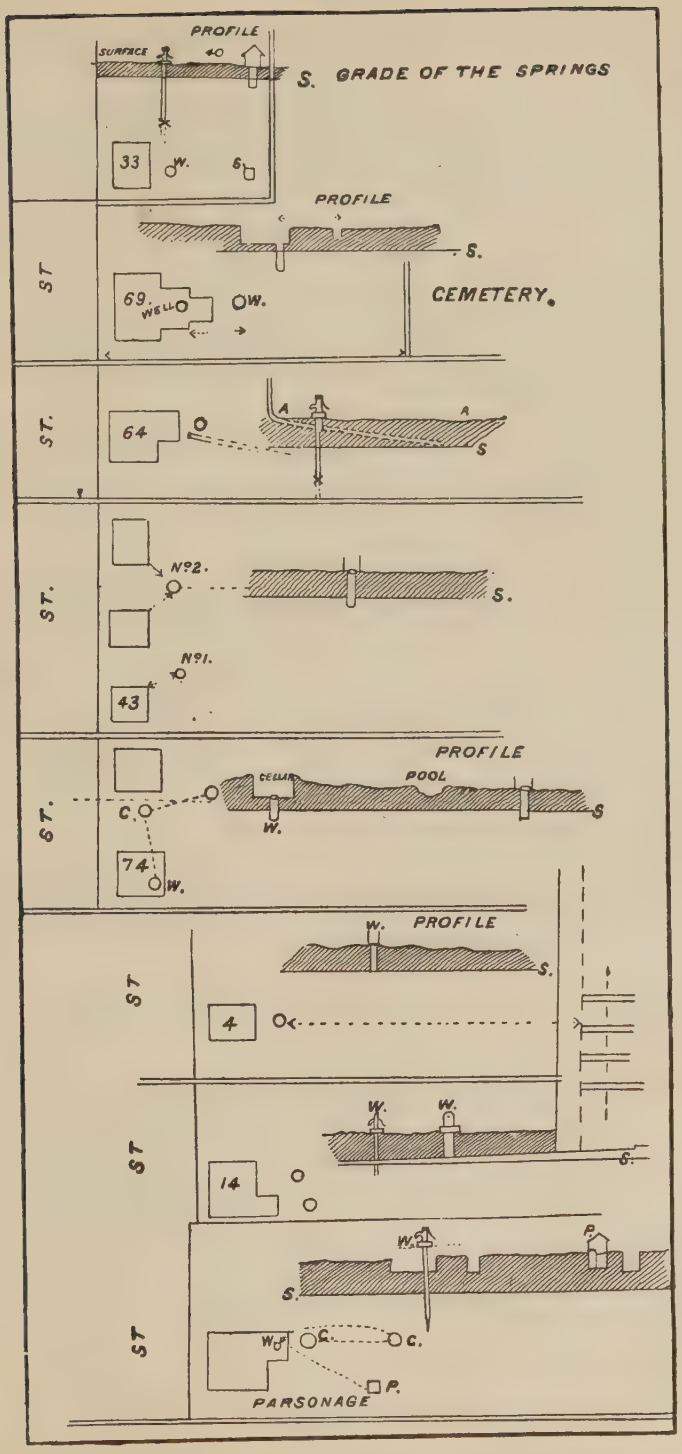
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SURFACE
S. GRADE OF THE SPRINGS
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PARSONAGE

FACTS IN REGARD TO THE SANITARY TOPOGRAPHY OF THE REGION AFFECTED.

On visiting the town of Babylon, with Dr. Hewlett, and carefully inspecting the limited premises where dysentery occurred, the following points were submitted to an observing and competent surveyor residing in the place:

ALBANY, *Nov.* 2, 1880.

W. W. HEWLETT, M. D., *Babylon, L. I.:*

Please put the following questions to Mr. Sammis, and see if we can obtain accurate statements now, before the exact kinds of observations are commenced, to determine the arrangement and relations of the *water-bearing strata:*

(1.) Where are there limited tables of hard-pan, and do the depressed grounds, like those south-west from the cemetery, generally have such thin water-bearing tables?

(2.) Of what are they composed? Is it a red or brown clay, with gravel? How thick is the upper table, and how deep is it below the surface?

(3.) Does lowering and raising the great pond correspondingly affect the wells? Does the tide affect the height of water in the low wells?

(4.) In the "driven" wells, are the qualities of water various in wells of different depths?

(5.) At what depths (along streets just where the sickness occurred) is the distance to water as shown in shallow excavations?

(6.) Is the bottom of the privy vault usually upon or above a hard-pan table?

(7.) Do the wells usually pass through one or more of the hard-pan tables?

(8.) What tangible or visible evidence is there that the ground-water has a rapid soakage, from foul or other places, directly into the well (as at the parsonage)?

Yours,
E. HARRIS,
Secretary.

NOTES, MAP AND DIAGRAMS RELATING TO THE REGION DESCRIBED IN DR. HEWLETT'S REPORT — BABYLON, L. I.

(1.) From my personal knowledge I only know of hard-pan in the bed of creeks and streams and under marshy and swampy land. Well-diggers claim to find it in various sections, but from their statements it must be about on a level with the beds of the streams. After passing through the surface-soil and from one to two feet of loam, we find sand and gravel, until the hard-pan is reached. The Babylon cemetery is not depressed or basin-like, as the elevations on the map will show.

(2.) The hard-pan that I have had to deal with is from four to six

inches thick, composed of a dark mixture of reddish-brown clay, loam, sand, gravel, and some iron. A pick or crowbar is required to break through it. The depth below the surface, as far as I understand, depends upon the elevation of the surface above the bed of the stream, well-diggers estimate from six to fifteen feet, or rather that is their experience upon which I base my opinion.

(3.) The lowering and raising of ponds does affect shallow wells. A pond with five feet head, when let down, will lower the water in wells which are from 300 to 400 feet away, at least one foot in twenty-four hours after the pond is down. A surface well that distance from a pond was said always to become dry when the pond was let down for repairs of mill, etc.

When a pond has been let down for ten days or so, and the earth has been thoroughly drained, if the pond is again filled to five feet head, the earth will fill to same level at a distance of 220 feet in twenty-four hours, according to an experiment of my own for the purpose of testing approximately the velocity of water through sandy soils at different heads. I have never known of any wells being affected by the tides, except running springs by the shore when overflowed by storm tides. The usual rise of tide with us, on the Great South Bay, is about one foot from mean low water.

(4.) It is usually conceded that the best water is at the "lower springs," which are claimed to be below hard-pan or in the "second springs," as it is termed, but apparently pure water is found at four or five feet, *i. e.*, the depth to water in well.

(5.) The little profiles on the second map show how low the springs are now. The profile at No. 14, south of the parsonage, shows .75 of a foot or nine inches above tide, but the springs north of the rail-road have an elevation of from 5.83 to 6.39 feet above tide-level. The surface of the water in the adjoining brook, opposite the cemetery, is 5.76 feet above tide-level. So the grade or level of springs or well-water in that region is a few inches above that of the brooks. Were these two ponds drawn empty by removing their dams, the shallow wells which have only eighteen or twenty inches of water would be dry.

(6 and 7.) These, I think, are answered above; as you will see on the map that some of the wells are dug from four to five feet below tide-level.

(8.) I have shown (3) that a five-foot head (height) of water will force the ground-water 220 feet in twenty-four hours. A cess-pool filled five feet in depth (head) cannot be long in forcing its polluted water to the level or grade of a spring and onward to it; and the more rapidly will this occur if assisted by the draft from the well (or spring) on certain days when much water is drawn.

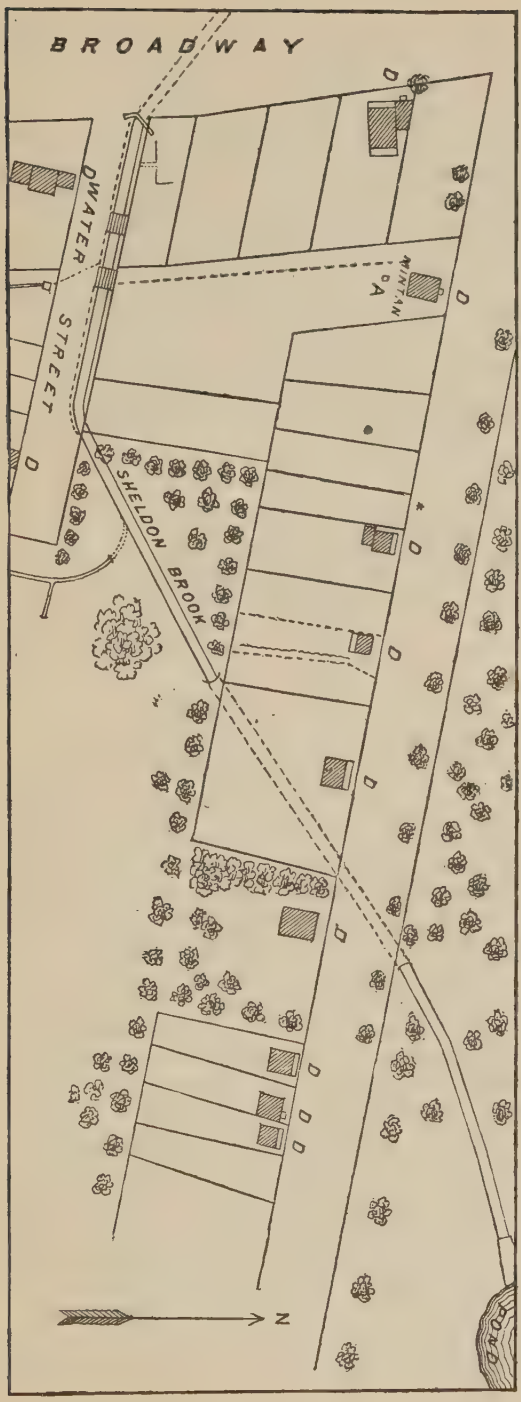
J. SAMMIS.

A Report of a Limited Epidemic of Dysentery at Tarrytown.

To Secretary of the State Board of Health:

Sir — We send you the following communication that you may see what has been done and what we are doing in Tarrytown.

We would respectfully report that dysentery has occurred during the present year on Broadway in the vicinity of what is known as Penny Bridge, on the north-western border of this village. There were eighteen cases, with six deaths. Four other cases, with two deaths, have occurred within a quarter of a mile of the "Penny Bridge;" cases, all of which were much exposed in the "Penny Bridge" district.



This region is low, being but little above tide level, was originally a swamp, and through which runs a shallow stream. The district comprises twenty-five dwellings with about one hundred and twenty-five inhabitants. The wells are in close proximity to the houses and some have their wells or springs in their cellars. The wells are from nine to fifteen feet in depth, and having about three feet depth of water. The water consequently must be surface water. The water contains bacteria and various organic impurities. Their privies are within twenty and twenty-five feet of their wells. The stream running through this section has been deepened and widened and so improved during the past summer that the wells have been lowered. We have no doubt that this improvement has been an exciting cause of this epidemic. This work was not done under the advice or consent of the Board of Health. It was done by the cooperation of the property owners surrounding this locality. We have thought best to bring this epidemic and its causes to your notice, that it may be of some advantage to other local authorities.

Malaria has not been

as prevalent in Tarrytown as formerly. Its decrease is attributable to the filling up of ponds, the thinning out of trees and shrubbery which have prevented the sun from entering the dwellings, and the emptying of cess-pools and privies. Drains have been much improved, yet still there is much room for further improvement. Undoubtedly much of the malaria along the Hudson has been due to the damming up of natural water-courses by railroad embankments. We would respectfully call your attention to the need of a suitable general statute for the sewerage of villages containing 5,000 or more inhabitants. It is claimed by our trustees and their counsel that they have no power to appropriate moneys not voted by the inhabitants of the village; yet through the recommendation of our board, the trustees have appropriated moneys to be expended on an exit for a sewer into the river and a hopper connection for the emptying of cess-pools and water-closets, until a more thorough system of sewage is established, etc., etc.

Inclosed you will find a sanitary map of the district in which dysentery has prevailed.

All of which is respectfully submitted.

(Signed) N. C. HUSTED, M. D.,
President of Board of Health.
N. H. FREELAND, M. D.,
Health Officer.

House Epidemics. Defiled Well Water.

Information which is constantly being received by this Board in reply to inquiries concerning local causes of fatal diseases, frequently presents a record or series of indisputable proofs which read like an *indictment* against the very dwelling-house in which the inmates have been killed outright by the secret sources of poison and disease that lurked in and near them. The neglected cellar and the family well have been the sole causes of many a house-epidemic that has seemed as wanton a tragedy as any which stealthy assassins could plot and perpetrate. The part which polluted wells and neglected domestic sewage had in causing dysentery in various places, and in perpetuating and stimulating the increase of diphtheria in Geneva, none will deny. The wholly spontaneous outbreak of fatal maladies of the bowels from defiled well water, as described in the two instances here recorded, are important for the complete proof they give concerning the necessity for widespread information on the subject of water-supplies, and the protection of wells and building-grounds against foul soakage and any neglected drains, cess-pools and privies. Occurring as these home-tragedies did, in dwellings of affluence, situated upon high hills noted for salubrity, this brief record of them should be published for the benefit of the people throughout the State.

A House Epidemic of Enteric Fever upon a high hillside near Ithaca in 1880.

In reply to inquiries by the State Board of Health, Dr. Z. H. Potter, a professor in the Cornell University, has offered the following statements, and submitted accompanying notes from Prof. Breneman, concerning a household calamity which was so fatal, as well as apparently causeless, that the entire community for many miles around was aroused to inquire "what was the cause?" The scene of this outbreak was at an old farmhouse about two miles west of Ithaca and up the steep hill that overlooks the head of Cayuga lake, on the Mecklenburgh road to Seneca lake. Prof. Parker's statement is as follows: The family consisted of five members, namely: Mr. M. Sexton, aged 60 years, his son, aged 24 years, a daughter, Mrs. K., aged 26 years, Mrs. K's daughter, aged 5 years, Mrs. Sexton, wife of the first named.

Mr. Sexton and his son were attacked, at about the same time, with chills, etc., and about the seventh day with diarrhœa; on the ninth day they had hemorrhage. The father's fever continued about four weeks; he recovered. The son survived only eighteen days, when he died from hemorrhage of the bowels.

The daughter, Mrs. K., was attacked with like symptoms and died in four days from hemorrhage of the bowels. Dr. Morgan, her physician, considered it a case of rapid destruction by perforation of the bowels.

The young daughter of Mrs. K. was attacked in the same way; lingered three weeks and died of hemorrhage.

Mrs. Sexton, the last of four fatal cases, was attacked in like manner, and on the third week died of hemorrhage, having at the last some pneumonia.

Dr. Morgan, the attending physician, says, "that the drain from the kitchen and wood-house was by a large box tube, about twelve inches square, without a trap, and that the top of the funnel stood four feet higher than the well-top, and that the well and the cess-pool, or outlet of the drain, were not more than eleven yards apart. The drain from kitchen to cess-pool was made of hemlock boards, now entirely rotted away, so the drain was simply in the ground for years past."

These cases of sickness occurred in January and February, 1880.

The accompanying drawing was made by Dr. Winslow. It shows the relative situation of the well, the drain and cess-pool, and the dwelling-house and kitchen hopper. The attending physicians assure me that even during the sickness of the family the excremental discharges were emptied into the hopper.

I have mentioned your inquiries and requests to Prof. Breneman, my colleague in the university, and he kindly sends to you a copy of his notes concerning the water analysis. * * * We are much indebted to him for his indefatigable labors in analyzing our waters hereabouts. He analyzed the waters in Geneva during the recent epidemic of diphtheria there, and did much to induce the people of

that beautiful village to set on foot the good work of building a system of sewers. * * * * * *

Wishing that the foregoing facts may be of service in promoting sanitary reform and the cause of science,

I remain yours,

(Signed) ZIBA HAZZARD POTTER, M. D.

NOTES ON A HOUSE EPIDEMIC AND THE DEFILEMENT OF WELL-WATER AT A FARMHOUSE IN TOMPKINS COUNTY — ANALYSIS OF THE WATER, ETC., BY PROF. A. A. BRENEMAN, OF CORNELL UNIVERSITY.

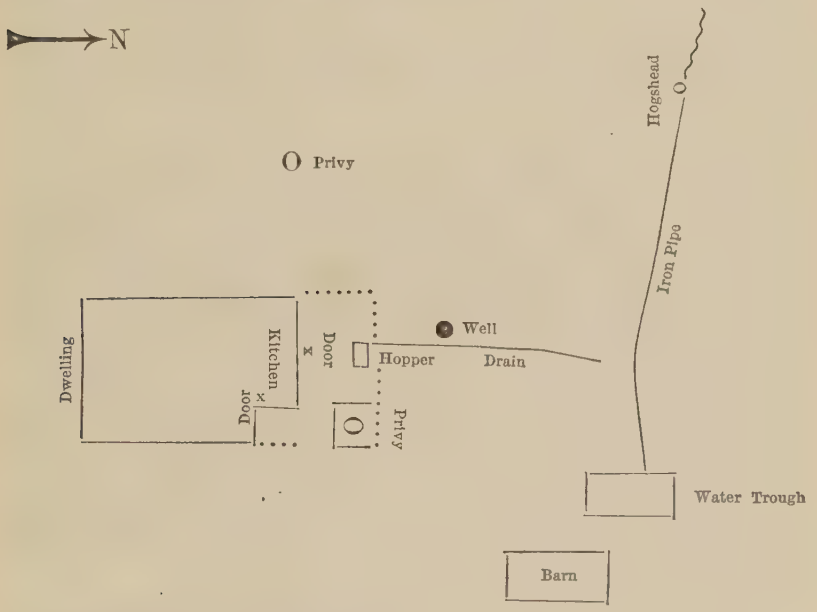
My first knowledge of the case mentioned in Prof. Potter's letter was derived from a neighbor of Mr. Sexton, who brought me a sample of well-water to analyze, reporting at the same time that several of the family were prostrated by typhoid fever. This was on January 17, 1880. The high proportion of chlorine in the water attracted my attention, and, together with the abundance of free ammonia, seemed to point to contamination of the well by urine. Two days later, wishing to make a closer investigation of the case, I went to the house of Mr. Sexton and examined the premises, taking at the same time a sample of the water for examination, in a bottle carefully cleansed by myself.

The house is an isolated dwelling, standing on high ground, some 250 feet above the level of Cayuga lake, on West Hill, near Ithaca. The marsh which skirts the southern end of the lake is about three-quarters of a mile distant, and the ground slopes continuously eastward to this marsh. The soil is gravelly, being a drift deposit, in which strata of sand and clay alternate with each other. Other than the barn and outbuildings there is no other house within a quarter of a mile, except the dwelling of a neighboring farmer, which is about 150 yards away, and on the same level.

Near the back door of the Sexton house is a well forty feet deep, fitted with a chain pump. A wooden drain, opening by a wooden hopper, near the kitchen door, conveys the slops from the premises to a cess-pool thirty to forty feet distant. This drain runs within three feet of the well on its way to the cess-pool, the hopper and the well being about six feet apart. The wooden trough or drain is buried a few inches under the surface of the ground. A wooden shed, resting against the house, incloses the narrow porch about the kitchen door, and the mouth of the hopper was situated about four feet from the ground, and between the edge of this porch and the side of the shed. To the east of the hopper was a privy used by the household, the other privy being some two rods away, and less accessible in cold weather. The privy and drain were therefore within the same inclosure, and close to the kitchen door. In entering the house by the kitchen you pass through this inclosure. The hopper and the ground about it were reeking with filth and fragments of food, and smelled strongly of urine, so much so as to taint the air of the entire shed. It was claimed that the privy vault was a

closed, water-tight box of wood, and that no leakage could have taken place from it. It was impossible at the time of my visit to examine it closely, but the situation with respect to the house and well was enough to condemn it.

The drain which had been found rotten and leaking at a point close to the well had been replaced by a new wooden trough in the same position. The accompanying diagram will illustrate, roughly, the topography and structures:



The water-trough received water from an *iron* pipe leading to a hogshead higher up the hill. The latter was fed by a stream in a ravine two or three hundred yards away.

The water supplied to this hogshead and to the trough below was used for the stock, but as it was slightly muddy at times the family preferred the well water to it.

I append the results of some analyses, made by Wanklyn's process, to show the condition of the water of the well, together with one of the trough water and one of water from a well at the neighboring farmhouse (150 yards south of Sexton's).

RESULTS OF ANALYSES.

SOURCE	DATE.	CHLORINE.	AMMONIA.	
			Free.	Albuminoid.
	1880.	Grains per U. S. gallon.	Parts in 100.000.	
Sexton's well.....	Jan. 19	4.0	.0310	.0060
Sexton's well.....	" 31	4.6	.0475	.0070
Sexton's trough.....	" 31	...	.0040	.0070
Well at neighbors....	March 16	2.2	.0078	.0040
Sexton's well.....	" 16	5.0	.0146	.0102

The abundance of chlorine and free ammonia in the well (Sexton's) as compared with that from the other sources, points clearly to a local source of these contaminations. Both indicate *urine* from the household slops leaking into the well or from the adjacent privy. The comparatively low numbers in the column headed "*albuminoid ammonia*" are probably to be explained by the fact that drainage reaching the well was filtered through gravel and thus deprived of its *suspended albuminoid matter*, while the natural temperature at the time was low enough to hinder the decomposition which would tend to produce soluble products from the same. An analysis of the well water made March 16, 1880, six weeks later, showed considerable improvement, due probably to mending of the drain.

Other details of the case, relating to the nature and progress of the disease, will be given you by Dr. Potter and others familiar with the medical aspects of it.

Hoping that this statement may be of service, I am,

Very respectfully yours,

A. A. BRENEMAN.

To the Secretary State Board of Health.

RECORD OF A FATAL HOUSE EPIDEMIC UPON A HILL-TOP IN OTSEGO COUNTY.

[A POLLUTED WELL AND FOUL CELLAR.]

To the Secretary State Board of Health:

SIR — It affords me sincere pleasure to be able to furnish you, in compliance with your request, the following bit of medical history. If you find it useful for the purpose of the State Board of Health, you are entirely at liberty to use so much of it, and in such a way, as may best promote the public welfare.

The accompanying diagram will, I think, illustrate the topography with sufficient accuracy.

E. B. resided with his family on a farm in the north-west part of the town of Middlefield and county of Otsego, near the Springfield line. The house stands on an elevation of four or five hundred feet above the neighboring valley through which flows the East Spring-

field creek in a south-westerly direction, discharging into Otsego lake at "Hyde Bay." The general course of the highway over the hill is from north-west to south-east; the house being located on its southerly side and on the north-westerly slope of the hill. On the opposite side of the road is a deep gully through which flows a small stream toward, and into the creek just mentioned, affording advantages unsurpassed for perfect drainage at small cost of material or labor. I can imagine no spot that ought to be blessed with more healthful surroundings. Truly "God disposes;" but man in his blindness, often *opposes.*

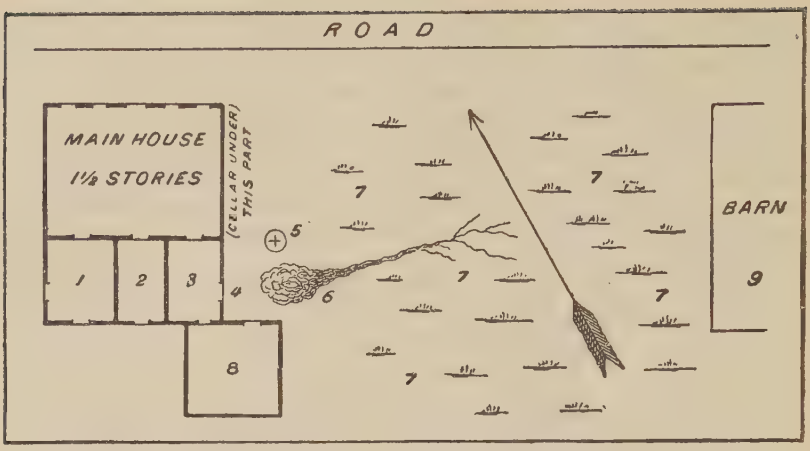
The family consisted of E. B. and Hannah, his wife; Silvia, his sister; David, Willard and DeWitt, his sons; Ann and Allova, his daughters, and Elijah Case, his grandson. There were also two carpenters, named Hardendorf, and a man Patten, boarding and lodging in the house at the time; making twelve persons altogether.

On Wednesday, the 5th of July, David Bennett sickened with a severe form of cholera-morbus. Dr. A., of Middlefield, was summoned to attend. On the 6th of July, Millard and Allova were attacked in a similar manner; and all three cases becoming critical, I was summoned in consultation on the morning of the 7th, and reached the house about noon. Willard was at that time moribund, and his father had been seized in the same way. Before midnight all three were dead. On the same day the two Hardendorfs left the house ill and went home to Springfield "Hollow." One of them died the next day. On Saturday evening (the 8th), Dr. Almy sickened, and was taken home at once. The carpenter Patten was attacked Sunday morning and died the same evening. Miss Ann Bennett and the boy named Elijah were very ill, but recovered. Miss D. and Miss M., who assisted in nursing, were also sick.

Thus of the twelve members of the household on the 5th of July, nine were sick and five died before the 10th; besides Dr. A. and the two heroic nurses, who, while others fled in dismay, stood over the sick and dying, forgetting consequences and thinking only of duty.

Three of the inmates wholly escaped, viz.: Mrs. B., Miss Silvia B., and the son DeWitt.

In each one of these twelve cases of sickness the onset was violent, and the whole course would rank as severe in any epidemic. They were attended with pain and cramps in the extremities and abdomen, copious "rice-water" evacuations and vomitings, shriveling and coldness of the surface, passing rapidly, in the fatal ones, into collapse. It may be well to add that no other instances of a similar sickness occurred anywhere in that vicinity at that time; or could that be traced to any other cause than the one localized at the house in question.



Explanation of this Diagram of the Premises.

1, 2, 3. "Lean-to."
1. Bed-room.
2. Pantry.
3. "Stoop."
4. Back door.
5. Well, from house ten feet.
6. Open drain for slops, and duck pool, near well.
7. Low, wet ground, saturated with liquid manure.
8. Cheese house.
9. Barns about 150 feet from house.

At the outset a searching investigation was had as to the cause of the sickness. The well was found to be in a *detestable* condition. The house was one-and-a-half stories high, with a "lean-to" behind; and the well was very near the back door, in the rear of the main house at the end of the annex. Slops were thrown from this door upon the ground; and a little trench had been dug to lead off the water. This trench the children had dammed with mud to make a puddle for the ducks to play in. The filthy contents could be seen flowing into the well. The cellar was in a condition not much better. Its bottom was nearly covered by slimy pools, with decayed boards and timbers to walk upon, partly concealing the abominations below. I have no doubt the well, which was not more than ten feet from the cellar wall, received a reenforcement of filth from this source. The pantry and milk room were in perfect keeping. Between the house and barns the surface was somewhat depressed, and the natural drainage northward had been interfered with, perhaps, by the road-bed; so that the space was wet and unsavory, the soil having become saturated by the wash from the stables and barn-yards. Altogether I have never seen premises in a worse hygienic state; and I am sure I cannot state these facts too strongly. Drs. Horace Manly, of Richfield Springs, and George Merritt, of Cherry Valley, were summoned to aid by their judgment and counsel; and there was no hesitancy or disagreement as to the *fons et origo mali*. The water was disgusting to both taste and smell; and of course the use of it for any purpose was at once strictly prohibited; all that was used being brought from a living spring, one-fourth of a mile distant.

In the main and in every essential particular, I am confident that

the above sketch is perfectly reliable. As to some minor details there may be slight variations from strict accuracy, owing to defective memory of individuals. No pains have been spared to obtain precise information on all points; and I believe nothing is wanting that could either add to its scientific value, or detract from the impressiveness of the lessons taught.

Sincerely yours,

HORACE LATHROP.

Cooperstown, *Nov.* 18, 1880.

Local Causes of Malaria in a region otherwise healthful.

Claverack, N. Y., *September* 28, 1880.

To the Secretary State Board of Health:

Dear Sir — In the report for August I report a death from "enteric fever." In that family were five (5) cases, four of which were under my control, and the fifth (servant girl), under the care of a neighboring physician. She died in two weeks after she was taken down, and four of her family are now dangerously ill with the same disease, having contracted it from her. The patient which I lost was a very fleshy lady, 44 years of age. She was apparently doing well until sudden and profuse hemorrhage came from the bowels. The cause of the disease in the first place, I think, was due to the water-closet, which I found in a very unsanitary condition. The husband of the deceased is now dying from this fever. He has suffered from "heart-fainting" for years. After the death of his wife he was taken down with fever and pneumonia.

Some four miles east of here (Mellenville, Col. Co.), malarial and typho-malarial fever of a very malignant type is raging in two houses containing eight (8) families each. There are over 30 cases. The houses are near a knitting mill and those afflicted are the operatives. The greater part of the summer the pond was dry and a large tract of mud and marshy soil was exposed to the rays of the sun, and the houses are not more than 100 yards from the pond.

* * * * * * * *

Very truly yours,

(Signed) THOMAS WILSON.

Dr. Elton Palmer communicates the following facts:

Mellenville, N. Y., *Nov.* 3, 1880.

Dear Sir — Your letter in regard to the sickness and mortality in our village has been received. The number of cases of "typho-malarial fever" may be placed at from 23 to 30 in our vicinity, and only one death that may be attributed to the form of disease mentioned.

The cases were in a confined area of about 600 yards in length, in which are two mill tenement houses, containing about 12 families in all. A mill pond is situated about 150 yards from the rear of

the dwellings, and owing to the dry weather, there was alternate rising and falling of the water from the mill, drawing it off, leaving the borders (usually covered by water) exposed to the width of 14 or 16 feet, thus giving all the conditions for the production of the malarial poison. A new well has been dug for the use of the operatives nearly on a line with the outhouses or water-closets which were used by all the families. This water became so contaminated by the drain that in cooking with it a distinct faecal odor could be discerned. This water was drunk for some time by the families living there, and to this cause I attribute the typhoid element of the disease.

An epidemic of "pertussis" has been among us during the past season, and is prevailing to some extent yet. But one death has been reported and that was from a pneumonic complication. During the heated term, "cholera infantum" was very prevalent among infants and children.

* * * * * * *

(Signed) Yours truly,
ELTON PALMER.

A physician in one of the northern towns of Dutchess county writes as follows:

* * * * * * *

During some of the last fifteen years, malaria has prevailed only moderately, but we have never been free from it, and this, I find, has been the case since the memory of the "oldest inhabitant," when I can find an honest one. We have our "off years" but never an entire freedom.

For the last three years malarial diseases have been much more severe than formerly in this neighborhood, not yielding so readily to remedies, and more apt to recur in some cases of chronic malaria with enlarged spleen and persistent anæmia.

* * * * * * *

(Signed) J. S. BIRD, M. D.

PUBLIC HEALTH AS AFFECTED BY ABANDONED CANALS, STAGNANT PONDS, OBSTRUCTED WATER-COURSES, AND OTHER SOURCES OF MALARIA.

On the 16th of November his Excellency the Governor transmitted to the State Board of Health a petition signed by 115 citizens of Millport and its vicinity, in Chemung county, praying for relief from the sources of malarial and other diseases which they allege to have arisen from the bed and margins of the abandoned canal, between the head of Seneca lake and Horseheads.

The petition and medical testimony on this subject read as follows:

Memorial from Citizens.

To His Excellency, A. B. Cornell, *Governor of the State of New York:*

Sir — We the undersigned inhabitants of the village of Millport and vicinity, living near the abandoned Chemung canal, do represent that the canal has been left by the State authorities in a very bad condition in respect to the health of the inhabitants.

They have taken down the bridges and filled up the road-ways across the canal with earth, without making suitable provisions for draining the canal. In several places these roads crossed the canal near the foot of locks where the water is left standing above the roads, and in said locks, from one to two feet deep, where all kinds of filth and dead water are accumulating and poisoning those who live near them.

Two prominent cases of this kind exist nearly in the center of the population in this village, and they deem it very unfair in the State to leave them thus exposed to the cause of disease and death after using their land for a canal forty (40) years, without giving them any compensation for it. For several miles along the line of the old canal malarial diseases have been of very frequent occurrence in consequence of the canal being left as it is.

We have called the attention of the State Superintendent of Public Works to this matter. We think it the duty of the State authorities to look into this matter and see that the nuisance of which we complain is removed, and we know not where to look for relief but to you.

Trusting that you will take our case into due consideration, and direct those whose duty it is to look to it, while we remain, yours,

H. Seaman, M. D.,	Geo. M. Beard, M. D.,
C. T. Hill,	Rev. J. R. Hutchins,
A. T. Kingsley,	Rev. E. D. Thurston,
C. E. Parsons,	H. K. Thomas,
H. E. Brewin,	and 105 others.
Alonzo Tifft,	

TESTIMONY FROM PHYSICIANS OF MILLPORT AND HAVANA.

MILLPORT, N. Y., *December* 6, 1880.

To the Secretary State Board of Health:

DEAR SIR — I have the honor to report in regard to the sanitary condition of this section of the country consequent on the abandonment of the Chemung canal, the following:

Beginning about one mile north of the village of Horseheads is a marshy tract of land about three miles long and one-fourth of a mile wide, extending north to the village of Pine Valley. The canal was built through one side of this marsh, and at some points the bottom of the canal is on a level with the surrounding land, at others below, and still at others above. On the abandonment of the canal a pool of stagnant water was left in its bed over two miles in length, which would require a ditch over a mile in length, averaging four feet in depth, to properly drain.

The State authorities, in filling the road-crossings, succeeded in leaving a stagnant pool at almost every crossing, especially in the village of Millport, where, in two instances, the road crosses at the foot of the old canal locks. The culverts were so made that a body of stagnant water, averaging a foot or more in depth, was left in the bottom of the locks and canal between them and the crossings. The expense of effectually draining these cess-pools would be greater than the people of the immediate vicinity could bear, and if the State will not come to their relief and abate a nuisance which was deliberately created by its officials, they will be forced to abandon their homes to preserve life.

I have been a resident of this village since April, 1869, and from that time until two years ago I did not have a case of disease of a resident of this locality which could be traced to malarial causes. My practice extends to the village of Pine Valley, and except in seasons when the canal was dry a portion of the time, no miasmatic diseases prevailed there. For the past two years the character of diseases has radically changed. At Pine Valley intermittent and remittent fevers prevail to an alarming extent, and all along the line of the abandoned canal from the south end of the marsh to the village of Havana, malarial diseases prevail and increase in severity as time runs on. Hoping the State Board of Health can be the means of affording us relief in abating a nuisance for which the State alone is responsible, I remain,

Yours, etc., GEO. M. BEARD, M. D.

MILLPORT, N. Y., *December* 6, 1880.

Dr. ELISHA HARRIS, *Secretary State Board of Health:*

DEAR SIR — Your kind communication of the 17th ult. came duly to hand, and it gave us much pleasure to learn the deep interest you take in the preservation of the public health, and that you so clearly see the duty of the State of New York in relation to her abandoned canals as affecting the health of the people along their course, and in relation to the Chemung canal I have the honor to report as follows:

After the large quantities of earth which it was necessary to remove in the construction of this canal had become thoroughly settled and the canal filled with water during the boating season, the valley through which it runs became very healthy, and all forms of malarial diseases disappeared from the summit down to Havana, and for many years it was a subject of common remark, that our valley was one of the most healthy sections of the State. But this agreeable and truthful assertion can be no longer applied to this valley. Since the canal was abandoned, malarial diseases have become more common than was ever known before among the citizens of this valley, intermittent and remittent, and in some cases congestive chills, are of frequent occurrence and have become the prevailing type of disease among the people.

In abandoning the canal no care has been taken in regard to its sanitary condition. When built the bottom of the locks were set as low as the basin of the canal and as little care has been taken to keep it bottomed out, the basin has filled in from one to two feet, while the bottom of the locks have remained in *statu quo*, leaving each lock a large sink hole for the accumulation of all kinds of filth; and these locks are 44 in number in less than eight miles. In the village of Millport are six of these locks, all in the condition described and two of them nearly in the center of this village. Where the State lands have filled in the roadways, they have left the bottom of their culverts under the roadways from one to one and one-half feet above the bottoms of said locks.

Thus you see how we are exposed to disease and death, through the action of our State authorities and from which we have no escape without they come to our aid, and must suffer the consequences of the present condition or leave our homes.

All of which is respectfully submitted,

H. SEAMAN, M. D.

MILLPORT, N. Y., *December* 10, 1880.

Dr. ELISHA HARRIS, *Secretary State Board of Health:*

DEAR SIR — In compliance with your request to my friend Dr. Seaman, I have the honor to report that I have resided and practiced medicine in this place for the past 14 years, that I have read the report of Drs. Seaman and Beard on the condition of the abandoned

Chemung canal and fully agree with said report of malarial influence as a factor in the production of disease.

The road crossings and culverts are made in such manner as to leave nearly a continuous line of stagnant pools of water extending from lock number 1, north of Havana, to lock 44 a little north of Horseheads, a distance of about 12 miles, and that during the past two years malarial diseases hitherto almost entirely unknown in this vicinity have become the pest of the community and the dread of every household.

The uncertainty of title and the difficulty and expense of drainage make it necessary for the State to take the matter in charge, unless our little valley is to be abandoned to the ravages of disease and death.

Hoping the State will, for the preservation of health, take immediate action and abate the nuisance.

I am very respectfully yours,

L. W. BAILEY, M. D.

HAVANA, N. Y., *December* 8, 1880.

Dr. ELISHA HARRIS, *Secretary State Board of Health:*

DEAR SIR — We respectfully indorse the inclosed communication from the physicians of the village of Millport, believing it to be true in every respect, and would further state that nearly the same condition exists in our own vicinity. The State authorities in abandoning said canal have certainly created a public nuisance which is detrimental to the public health of the citizens for some distance each way from the canal. The officials in removing bridges, locks, and building culverts have left ponds or pools of stagnant water which emit malarial poisons, endangering the health and hazarding the lives of our citizens, demonstrating that the medical profession should ask succor from those who have the power to come to their aid and effectually abate said nuisance.

We are fully satisfied that remittent and intermittent diseases have largely increased for the past few years, at least fifty per cent since the abandonment of the Chemung canal, indicating to us that as the guardians of the public health, we must call upon the State Board of Health to aid us in securing protection of the health and lives of our citizens.

Very respectfully,

GEORGE M. POST, M. D.,
J. B. AMES, M. D.

HAVANA, N. Y., *Dec.* 6, 1880.

ELISHA HARRIS, M. D.:

DEAR SIR — Your attention has been called, I understand, by a large petition from Millport, in regard to the abandoned Chemung canal. It demands your attention, as a State Board of Health. It

has been and is the breeder of zymotic diseases. Please give it your attention. Any co-operation that may be needed, I will gladly assist on my part.

Yours very respectfully,

B. T. SMELZER, M. D.

The foregoing statements show clearly enough that abandoned canal bottoms have begun to illustrate quite conclusively how malaria may be developed from newly created conditions, and from very limited areas of saturated and partially dried foul grounds.

As the sudden abandonment of such a canal as that between Seneca lake and the *summit* above Millport, where there were *forty-four locks*, and as many separate and artificially obstructed *levels* in a distance of ten miles, provided the occasion for the unlooked-for misfortune which the people of Millport now complain of, it is important to devise the best means for speedily and permanently overcoming and preventing these evils. The sanitary requirements are plain, and with the authorization which the Legislature will need to confer upon the proper departments, the advice which the State Board of Health should give in regard to the matter will, it is believed, result in the removal of the evils complained of.

While hoping for such a result, it is well to notice the historical facts concerning miasmatic disorders in the valley through which that section of the Chemung canal, now complained of, was built. Dr. Seaman, a venerable physician of Millport, states that after the new banks of the canal had become thoroughly settled, and the canal filled with water and brought into use, the valley, from the summit down to Havana, became very healthful and "all forms of malarial diseases disappeared," so that this historical valley of General Sullivan's march and of the romantic memory of Catherine Montour, became renowned for its salubrity. In the two summers and autumns since the disuse of the canal and the withdrawal of the water from it, "*intermittent, remittent and congestive chills* are of frequent occurrence, and have become the prevailing type of disease among the people." These events are exceedingly instructive. The few simple conditions here co-ordinated in the development of malaria in one of the valleys of high altitude in the State are well described, and doubtless may be readily controlled and overcome, though the specific nature, or germinal description, of the essential and particulate cause of the malarial diseases, continue to elude the close researches of all scientific inquirers.

With the obvious facts and a correct record of events relating to the causes of the evils complained of by the people of the district bordering upon the nuisance of the empty canal, there can be no misapprehension of the duty which the State owes to people of that region. The people themselves will be sure to lend cheerful co-operation in efforts to give complete success to the drainage and regulation of the grounds which are now accused as the source of disease. This Board's standing committee on drainage, sewerage

and topography will complete its report upon this subject before the Superintendent of Public Works can begin the improvements which it is now believed the Legislature will order to be executed.

PRELIMINARY REPORT BY COMMITTEE ON DRAINAGE, SEWERAGE AND TOPOGRAPHY.

Report on Chemung Canal Nuisance.

The complaint of citizens of Chemung county that the abandoned canal in the neighborhood of Millport and Havana was left by the State in a condition injurious to the public health, having been referred to this committee, and the complaint being supported by strong medical testimony, we have obtained such information on the subject as could be gathered at this season of the year, and are of the opinion that parts of the abandoned Chemung canal are probably in a condition likely to produce or increase malarial diseases, and that parts of other abandoned canals may be in a similar condition.

We therefore advise that the State Board of Health recommend to the Legislature that an appropriation be made for putting in a sanitary condition such parts of the abandoned canals as may be declared by the State Board of Health in a condition to injure the public health, and that this work should be done by the Superintendent of Public Works, under the advice of the State Board of Health.

(Signed) JAMES T. GARDENER.
ELISHA HARRIS, M. D.
E. M. MOORE, M. D.,
President, Rochester.
JAS. G. HUNT, M. D.,
Commissioner of Health, Utica.

Dr. Hunt, as a member of this committee, states: "I would like to add to its report in regard to the Chenango canal, or that section of it which comes under my immediate sanitary jurisdiction in and near the city of Utica.

On the 2d day of April last I wrote as follows:

"'*Secretary National Board of Health, Washington:*

DEAR SIR—I wish to speak of the condition of the abandoned Chenango canal. This is a subject of great importance to the citizens of Utica, as well as to those living along the line of it. From Binghamton to Utica, a distance of ninety-five miles, this canal runs through a thickly settled country, and many small towns and villages. It is nothing more nor less than a receptacle for all the filth from sewers, privies, drains, etc., and with a very small quantity of water, scarcely enough to cover the bottom. Along this bottom the bed of filth extends for a distance of ninety-five (95) miles, exposed to the sun. And moreover this filth empties into the Erie canal

at Utica. We are in hopes of remedying this evil through the State Board of Health (providing a law is enacted to create the Board), having it *filled up*. It has been, for four or five years, abandoned.
* * * * * * * * *

"I also wrote to the State Superintendent of Public Works, on the 16th day of July, telling him the condition of said canal, and asking for relief, and also if he could keep the canal full of water, so as to prevent an epidemic of malaria, etc.

"For a long time our sewer system in that section of the city where the Chenango canal is located, deposited its sewage matter into the canal, which was partly the cause of the nuisance, but we have kept constantly at work building new sewers and connecting with the main sewers that empty into the Mohawk river. Until now all have been completed, and the sewage is not now deposited in the Chenango canal, so that the private owners are no longer responsible (except in a few instances) for the nuisance; and, at the present writing, through the aid of the Utica Steam Cotton Mills Company, the common council and the Superintendent of Public Works, we are in a great measure relieved of it.

Very truly yours,

JAS. G. HUNT, M. D.,
Health Officer, Utica."

Petition of the Citizens of Schenectady concerning the Cemetery creek Nuisance.

During the last week of August, numerous citizens in Schenectady petitioned His Excellency, Governor Cornell, for relief from the nuisance of the Cemetery creek, which bisects that city and receives in its course, as it flows toward the Mohawk river, whatever filth and sewage the inhabitants near its filthy bed can turn into it. This nuisance was immediately inspected by two of the State Commissioners, who conferred with the municipal authorities and urged that the stream should be daily flushed, and that sanitary ordinances should be enforced against its further defilement.

The petition is as follows:

To His Excellency, Alonzo B. Cornell, *Governor:*

We, your petitioners, respectfully represent that the condition of an open sewer-way that flows through this city, known as the Cemetery creek, is such as to cause grave apprehensions in regard to the health of neighboring residents and their families and the community at large. We, therefore, petition that you may bring the subject speedily before the State Board of Health, to the end that the channel complained of may be officially visited and such steps taken as in the opinion of the Board may be deemed essential.

And your petitioners will ever pray, etc.

(Signed by twenty-two citizens.)

Schenectady, N. Y., *August* 24, 1880.

A Petition of Citizens of Yonkers, to secure Compliance with Municipal Ordinances of that City.

Defilement of the Nepperhan river by sewage and other nuisances.— On the 14th of September, a petition was referred by His Excellency, the Governor, to the State Board of Health; but no action could be taken until the city authorities of Yonkers shall have endeavored to secure obedience to their own sanitary ordinances.

The petition is as follows:

To His Excellency, Alonzo B. Cornell, *Governor:*

The petition of the subscribers, citizens of Yonkers, State of New York, respectfully shows that there is existing in this city a nuisance, dangerous to the public health, which the city authorities have utterly failed to remedy or mitigate, although their attention has been repeatedly called to it.

This nuisance consists in the condition of the bed and the banks of the stream known as the Nepperhan or Saw-Mill river. In the course of this river through the thickly settled part of the city, it receives the sewage from about one-half of that part of the city.

There is upon this stream, within these limits, five mill-ponds, and this sewage settles upon the banks and bottoms of these ponds and there putrifies and becomes offensive and dangerous to the public health. Therefore your petitioners would respectfully request your Excellency, in accordance with section 8, chapter 322 of the Laws of 1880, to order the State Board of Health to make an inspection and abate this nuisance. And your petitioners will ever pray.

(Signed by twenty-two citizens.)

Dated at Yonkers, N. Y., *September* 13, 1880.

Malaria at Hart's Falls (Schaghticoke), Rensselaer County.

Early in August the village Board of Health at Hart's Falls, a manufacturing village in the midst of the hills of Schaghticoke, bordering the Hoosic river, near the eastern boundary of Pittstown, Rensselaer county, petitioned the Governor of the State in the following terms:

Albany, N. Y., *August* 2, 1880.

To His Excellency, A. B. Cornell,
Governor of the State of New York:

Sir—As President of the Board of Health of Hart's Falls, Rensselaer county, and by request of said board I have the honor to lay before you the following statements, and earnestly request such action by you and by the State Board of Health, by your direction, as shall meet the necessities of the people whom I have the honor to represent in this statement and appeal to you.

The case to which we would call your Excellency's attention

relates to the danger of life and the great detriment to health which the inhabitants of the village of Hart's Falls suffer in consequence of certain obstructions that have diverted the waters of the Hoosic river from their natural channel and the extensive lowlands along the eastern margin of the village, so that said former river-bed and said lowlands, at a distance of more than half a mile in length, have been rendered pestilential in consequence of the malarial and miasmatic emanations from the same.

The accompanying statements and body of evidence relating to this subject present the reasons and urgent necessity for this appeal to your Excellency.

The statement is illustrated by maps and is sustained by the written testimony of the physicians in Hart's Falls; also by an elaborate statement relating to the same subject by Dr. R. H. Ward, of Troy.

The essential points in this, and in the appeal we make, are as follows:

First. The evil complained of is so great that the entire population is exposed to it.

Second. It has been steadily increasing for several years past.

Third. It cannot be prevented or remedied by any system of drainage.

Fourth. The obstruction which has been placed in the old channel of the river, as it enters the north-eastern part of the village, has completely diverted the stream to a sole occupancy of a smaller channel extending southward; but this has produced no results which will hinder the course of the river in its chief old channel if such obstruction were removed.

Fifth. The obstructions which are here mentioned being just outside of the village limits cannot be removed by village authorities, but the village Board of Health and the inhabitants generally know and believe that such obstruction has no right to exist, and have urgently appealed for its removal, as is shown in the accompanying statement, and was created by and exists beneath the track of the Boston, Hoosac Tunnel and Western Railway.

Sixth. The removal of the obstruction can speedily and without detriment to public or private property be made by said corporation.

Seventh. Such removal of the obstruction and prevention of the evil complained of cannot be made under any order or action by the village or town authorities.

Eighth. The action now necessary on the part of the offending party, the Boston, Hoosac Tunnel and Western Railway Company, we believe, would be speedily effectual, and we hope would be undertaken, without any objections or resistance, whenever the conclusions of the State Board of Health and the Governor's orders on the subject shall have been given, as provided by chapter 322 of the Laws of 1880.

After patient and fruitless effort to secure the necessary action on the part of the offending party, as shown in the accompanying statement, and at the beginning of another sickly season, we deem any delay to be dangerous. Wherefore your Excellency is respectfully

requested to issue the necessary instructions to the State Board of Health and extend to the village of Hart's Falls such aid as the chief Executive of the State can now give.

Very respectfully yours,
(Signed) C. C. HILL,
President of Board of Health of Hart's Falls, N. Y.

The Governor directed the State Board of Health to examine and report for his information and guidance.

The area comprised within the elbow of the natural course of the river, as now cut off by the railway embankment, having become so prolific of malaria that nearly one-fourth of the entire population of the village were suffering from it, and under medical treatment, at the various times of our inspections there, the Board reported to the Governor of the State, as required by him under section 8 of chapter 322, of the Laws of 1880.

Having filed a copy of the Board's report in the office of the Secretary of State, the Governor issued an order upon the parties who are responsible for the production of the nuisance. As a great amount of investigation and evidence has preceded action in this case, the further description of the conditions which are now to be brought under remedial treatment, to remove the evils complained of, must be deferred until our second annual report.

SMALL-POX AND VACCINATION.

Early in August last the appearance and rapid spread of small-pox in Troy and other places in the eastern districts of the State, led to careful inquiries into the chief sources of the contagion, as well as to the extent and causes of the prevailing neglect of vaccination. Some of the facts obtained in this investigation are here presented.

A Brief Account of an Outbreak of Small-Pox in West Troy.

To the Secretary of the State Board of Health:

I inclose to you a brief account of an outbreak of small-pox in West Troy in 1877.

Small-pox is now gradually increasing in this community.

Yours truly,
H. L. WALDO, M. D.

West Troy, N. Y., *Nov.* 8, 1880.

On the 15th day of February, 1877, a party was held at the residence of one of the overseers of Messrs. Roy & Co.'s mills, in West Troy.

There were eighty persons present. For the first three or four hours, or until supper time, masks were worn by all persons present,

but just before sitting down at the table the masks were removed. It was noticed by some of the company that a young woman from a neighboring city, who had danced all the evening and mingled freely with all those present, had an eruption upon her face, but no special attention was paid to it and no one thought any more about it until the development of small-pox among those present recalled the circumstance. Subsequent investigation developed the fact that this young woman was thickly covered with varioloid pustules at the time that she attended the party.

At times varying from nine to fifteen days from the date of the party, twenty-two of the eighty who were present were attacked with variola or varioloid in various degrees of severity. Five of these cases were very severe, but none of them were fatal.

It was apparent to every one that there was great danger of an extensive epidemic of small-pox, and this would undoubtedly have been the result but for the prompt action of physicians in isolating the cases, and the general vaccination that was practiced.

The cases all occurred in the families of the employees of Roy & Co., manufacturers of woolen goods. As soon as the danger was apparent, the owners of the mills ordered all persons employed by them, in whatever capacity, to be vaccinated; and that this might be done at once, the mills were closed for one day, and none of the employees were allowed to enter the next morning without presenting a certificate from a physician showing that they had been vaccinated. Even those persons who had had small-pox were compelled to be vaccinated before they could enter the mills. A very large number of persons who were not employed in the mills were also immediately vaccinated. The cases were scattered about in private houses all over the first ward of the village. None of the patients were removed from their own houses, but the greatest care was observed that no one should come in contact with them, except those who nursed them and the physicians.

Eleven cases were contracted from these first twenty-two cases, after which the epidemic was at an end. Seven of this second edition were in one family, embracing the father, two brothers and four sisters of one of the first twenty-two cases. The brother who was first attacked continued to eat at the table with other members of the family and to associate with them until they were all taken sick. The other four cases of this second edition were in separate families, and one of them resulted fatally. Ten out of the eleven cases comprised in this second edition occurred in families in which there had been previous cases; that is, only one case occurred outside of the twenty-two families first visited by the disease.

Chloride of lime and carbolic acid were freely used as disinfectants, and all the rooms occupied by patients were thoroughly cleaned, and in most of them a thorough fumigation with sulphur was practiced.

The lesson to be learned from this epidemic is, I think, simply that thorough vaccination and complete isolation of the patients is sufficient to arrest an epidemic of small-pox.

Small-pox and Vaccination in Troy.

The first case of small-pox appeared in Mr. Lorrimer's, on Jackson St. in the person of a recent Scotch emigrant, a boarder in his family. On the Friday of his arrival he went to work suffering from pain in back and head, and soon suffered from the eruption which is now reported to have been varioloid, but as he left Troy and returned to Europe as soon as he recovered, there is no further knowledge of his case. On the 9th of August, a child in the Lorrimer family was found to be suffering from a similar eruption to that of their Scotch boarder. Other cases in the same tenement soon followed. Before the end of the first week in September other cases appeared in south Troy; the disease had already spread widely among classes of inhabitants most difficult to bring under sanitary regulations. The results which followed are here summarized.

The Health Officer of Troy reports that the total number of cases reported was 757, and that of these there were sent to hospital 455. There were 133 deaths in the hospital, and 105 deaths among the 312 patients that were quarantined in the dwellings where found. The 238 deaths in the total (757) cases reported by the Health Officer shows that 31.44 was the percentage, or nearly 1 in 3 was the ratio of mortality. This unusual death rate indicates sequestration of a great number of lighter cases. The fact that there was such hiding of varioloid patients was the greatest peril to the public safety. The public provision and offering of vaccination began soon after the cases of contagion began to be officially dealt with. House-to-house vaccination was organized, but with a force inadequate to such duty in a population of 57,000. A central vaccination office was also maintained. The records of the city Health Department show that in the search for persons who needed vaccination and to whom it was officially offered there were found 23,414, or more than 28 per cent of the entire number of inhabitants. There were 2,622 persons who refused to be vaccinated. There were 20,792 who accepted this public offering. There were 9,873 vaccinated who had no mark of previous vaccination; and there were 10,919 revaccinations. The results show that in 6,711 of the 9,873 primary vaccinations the full effect was obtained, and that in the 10,919 revaccinations the full result was obtained 3,883, or 35 per cent of the cases. Bovine virus from Brooklyn was used. Small-pox continued to prevail dangerously until upward of 60 per cent of the inhabitants of the city had been freshly vaccinated. The migrants into the city, especially from Canada and foreign parts, continue to supply fresh subjects for the Small-pox Hospital and to require the city vaccination office and a house-to-house vaccination to be continued.

Small-pox and Vaccination in Lansingburgh.

The village of Lansingburgh being geographically a prolongation of the riverside streets of Troy, its inhabitants were exposed to the contagion which had become widely scattered in that city. The

records of the Board of Health of Lansingburgh show that, beginning on the 21st of August, there were 41 cases of small-pox in this village; that 6 were fatal; that the first case was a mechanic whose daily exposure in an infected place in Troy, 3 miles from his residence, was regarded as sufficient to account for the contagion; that the second case and a group of 4 cases were known to have resulted from the visit of the mother of the group to see her sick sister, with small-pox, in Cohoes; and that the rule for the vaccinal protection of all school children was promptly enforced. Public vaccination was offered at the Health Office. Domestic quarantine was uniformly maintained; a posted notice on the house and premises, and a constabulary guard giving warning. The dwelling-houses being quite separate and in open grounds, this was practicable. But even here the experience proved that an isolated quarantine-cottage would have been preferable, economical and far more safe.

Small-pox and Vaccination in Waterford.

There were six cases of small-pox in this town, the first of them being traced to Cohoes and Troy. The public school pupils were completely protected by the enforcement of the rule of vaccination. The physicians promptly vaccinated and revaccinated the inhabitants that were found unprotected. There were no deaths from small-pox.

Small-pox and Vaccination on Green Island.

This island village in Albany county is virtually a suburb of Troy, separated from it by the river and bridges. The first case officially reported appeared on the 4th of October — a female collar maker, who had attended at a crowded church in Troy, where numerous worshippers were known to have contracted the contagion. The disease appeared in her on the 14th day after exposure. The family next door attended the same church and began to suffer on the 15th day after the exposure. On the 25th of October, a new center of the contagion was discovered and traced directly to an exposure in Cohoes. From these beginnings the disease spread in various directions, but was kept under domestic quarantine and restrictions, as the cases could not be sent to hospital. School children were vaccinated, and vaccination was freely offered to the inhabitants by the Board of Health. A new outbreak occurred at the beginning of winter in the family of a tailor employed in Troy in repairing-second-hand coats.

A further center appeared in the little child of a citizen who had a fortnight before received back from the shoemaker in Troy a mended boot. Immediately upon this new outbreak it was ascertained that the Troy shoemaker had just buried one child from small-pox, and that with two others sick, the father had been watching at night and working at his humble trade of mending by day, passing back and forth from his sick children to his work upon the bench in the same humble dwelling and shop. The little child on Green Island handled and toyed with the mended boot the day it was returned to

its owner, the father. The testimony taken in these cases scarcely admits of a doubt of the correct tracing of the contagion. There were 42 cases in all upon Green Island in a population of about 4,500. The cheerful acceptance of vaccination as the safeguard, and of the rules of strict domestic and personal quarantine and disinfection in every house where the disease appeared are justly regarded as the means by which the people of Green Island escaped with so little harm.

Small-pox and Vaccination in Cohoes.

Small-pox began September 15th, and up to the end of this outbreak there had been 153 cases and 36 deaths.

The Board of Health acted promptly and have maintained efficient sanitary supervision over the population from beginning to end.

Domestic Quarantine — A quarantine pavilion in a remote quarter of the city, thorough disinfection and a system of public vaccination, well supported by the city authorities and factory superintendents and owners, with the constant co-operation of all physicians have happily contributed to secure a degree of safety during the entire period that has rarely before been witnessed in such a population; for out of a total of 26,000 inhabitants upwards of 9,500 are employed in the factories, and of these a large proportion were unvaccinated when the outbreak began.

The State Board of Health had notified the Health Officer of Cohoes, on the 9th September, that the prevalence of small-pox in the south wards of Troy would reveal the extent of neglect of vaccination, and immediate attention was urged to the duty of providing for it. As soon as the contagion began to spread, Dr. Witbeck, Health Officer, obtained the consent and coöperation of the proprietors of Harmony Mills, where nearly 5,000 persons are employed daily, to open a vaccinating office and hold daily sessions there for offering free vaccination, and at the same time an apartment at the public charities office was assigned for like purposes. At these vaccinating stations there were 47 sessions for free vaccination. By this means and by house-to-house visitations the entire population of Cohoes was soon protected. An outbreak of the disease occurred in a French Canadian tenement, where there were 67 inmates — mostly emigrants from Canada and elsewhere — after the first outbreak ended. In that instance 22 cases, 7 being varioloid, occurred from exposure to a child that arrived from Montreal with small-pox.

The Health Officer reports that occasionally cases are concealed, especially if of varioloid, and in one instance of this kind 7 unvaccinated persons were exposed, and on the 9th day of their exposure were vaccinated, two of them suffering varioloid, four came down with small-pox. The factory cottages — 900 in number — of the Harmony Mills, have been kept under a system of constant sanitary supervision from first to last, and from the time the small-pox pavilion was opened, every person taken with the contagion has been promptly removed to that hospital.

Vaccination in the factories has been described by physicians performing it, as being "from mill to mill and from room to room," and as being "without resistance or protest." No fatal or dangerous results have ensued in any instance; bovine virus procured in Massachusetts, day by day, was the sole reliance.

The sanitary requirement for vaccination of every pupil in the public schools was promptly complied with. Dr. Witbeck reports: "Everything I did in my official capacity was seconded by every member of the board, and to their co-operation must be attributed much that has been accomplished in successfully combatting small-pox in our city."

Small-pox and Vaccination in Amsterdam.

October 9th, the Health Officer of this village reported to the State Board of Health a case of small-pox that had resulted from exposure to it in Cohoes. The upper floor of the house, and this patient and family were quarantined after several persons had been exposed. The contagion had already been communicated to the family on the first floor; that family removed from the town, some distance away from the village just before the outbreak.

The second outbreak occurred the 1st October in the Gibeau family, where a daughter was married on the 16th September; visited Troy on the 18th, remaining two days, returned to her mother's house and was taken sick on the 1st October. She died on the 14th of that month. Henry, her brother, was attacked on the 16th and recovered. The father, who had been vaccinated in infancy, was attacked with the disease in its mild form —varioloid,— the mother and her three sons and widowed son-in-law had also been vaccinated at former periods. They were re-vaccinated. Varioloid developed in two of the sons, and in one simultaneously with the vaccination. Before they recovered, one of the sons residing elsewhere clandestinly visited his sick brother, evading the quarantine guard. He contracted the contagion. A child also that had been visiting in Troy returned immediately and fell sick with the disease.

While these events were occurring, small-pox appeared in the town of Broadalbin, and was at once isolated by direction of Health Officer, Dr. Thorne. In this case the contagion was traced directly to the French Canadian brothers we have just mentioned. The Broadalbin outbreak was limited to two cases, rigorously quarantined.

Late in December small-pox appeared in one of the public schools of Amsterdam in a pupil aged 8 years. The Board of Health and trustees of the school agreed upon an order requiring the proof of thorough vaccination to be immediately presented by all school children, and school to be suspended until this duty was complied with. The order was promptly obeyed, all objections being successfully answered, the chief objector becoming an advocate and follower of the rule in his own household and neighborhood.

Small-pox in Fulton County.

The well-controlled outbreak of small-pox in Broadalbin has been mentioned above. Late in autumn the contagion was introduced in the vicinity of Wheelersville, a tannery village, in the north-western part of the county. The town authorities, through the nearest Health Officer, telegraphed for vaccine virus, and immediately provided for offering free vaccination from house-to-house. The sick were quarantined; the premises and infected materials disinfected and the contagion was extinguished in less than a month. This with the events in Broadalbin already mentioned, practically illustrates the utility of immediate and efficient action of town health boards in the presence of small-pox contagion.

Small-pox and Vaccination in Washington County.

On the 25th December, a number of citizens in the village of Shushan, town of Salem, appealed to the Governor, asking for relief from the operation of a local quarantine order that had been put in force in all highways entering that little hamlet of five or six hundred inhabitants. The petitioners, under instructions from certain medical prescribers who misapprehended both the nature of the disease and their duty, asked to be immediately left to walk in their own ways and enter public assemblages and conveyances. The officers of the State Board, to whom the petition was at once referred, advised the people of Shushan to comply fully with all requirements of the health authorities. By the same mail the State Board advised the Board of Health and Health Officer of Salem, to concert measures with the medical profession in that town to extend and offer vaccination to every family and secure the thorough application of it in every unvaccinated person in Salem. This advice was followed with remarkable fidelity; physicians pursued their duty in the matter, night and day, until upwards of 2,000 persons had been vaccinated. All the schools, chapels and other places of public assemblage were closed by order of the Salem Board of Health. The disease spread rapidly and fatally to the extent its contagion had been carried previous to the notification of the State Board, but it ended as suddenly as it had appeared, vaccination having completely occupied the field. The clergy and church officers of the town promptly complied with instructions to close the places of assemblage, and the R. C. Bishop of the diocese instructed the senior priest of that church in the town that his congregation should be dispensed from obligations of public worship until the contagion was past.

While small-pox was being suppressed in Salem, its appearance was announced in two of the adjacent towns, a neighborhood not far from Shushan. The prompt and adequate efforts of the town Boards of Health in each of these instances soon entirely suppressed the malady. The people, who had appealed to the Governor and the State Board of Health for relief from the operation of the local

quarantine at Shushan had, before five days had expired, become so convinced of their duty and utility of submitting to it, that the gentleman who had drawn the petition and protest, and obtained signatures to it returned to the State Board of Health a letter dated December 31st, saying: "Our people are now realizing more fully the magnitude of the calamity which has befallen us. We hoped it would not be necessary to enforce the stringent rules and that the disease would not spread from the houses of the first infected, but subsequent developments have shown us that it had at that time planted its seeds where we least expected it could reach. None of the persons who have died have been recently vaccinated." Hon. A. B. Law, residing near the village, was, at the time the foregoing letter was written, dying of small-pox. The writer of the petition here mentioned, reported his death, saying: "He died last night. It is sad to think of the death of such a citizen under such painful circumstances. His is the sixth death out of twelve cases of small-pox in our vicinity."

INDEX FIRST ANNUAL REPORT.

PAGE.

Analysis, Drinking Water 146–148
Appendix 25–200
Arietta, Diphtheria in 107–113
Asylum, Lunatic 55
  Illustrations Ventilating Apparatus ..... opposite 56 and 60
Babylon, Dysentery at 164
  Map of 167–169
Beach, Dr. Eugene 106, 107, 131
Boards of Health, Local 12, 140, 151
  National 37, 103
  State 103
Breneman, Prof. A. A 146, 147
Brooks, Hon. E., Discourse at New Orleans on Duties of the State 75
Buffalo, Sewerage and Engineering Problems 13, 88
Busti, Diphtheria in 138
By-Laws of the State Board of Health 7
Canals Abandoned, Miasmatic Fears from 183
Cess-pools 48, 144, 157–162
Chandler, Prof. C. F 86, 92
Chemung Canal, Condition of, as Abandoned 183
  Report of Committee on 188
Committees, Standing 8, 25, 28, 31, 55, 67
Covert, Dr. N. B 141–149
Delavan, Dr. J. S., Report as Chairman 30
Diphtheria 17–19, 105
  Hints for Preventing 130
Diphtheria, Dr. Beach's Report, in Arietta, etc 107
  in Benson 113
  in Wells 115
  in Johnstown 117
  in Northville 126
  Dr. Wright's Report 127
  in Otsego county 132
  in Oneida county 136
  in Chautauqua county 138
  in Schuyler county 139
  in Geneva 141
Diseases, Prevalent and Preventable 14, 105, 198
Disinfection 130
Drainage 13, 88, 183, 190
Drugs, Food and Drugs Act 82

PAGE.
Dysentery.....19, 152, 172–174
Financial Statement.....22, 25–27
Freeland, Dr. N. H..... 174
Fulton and Hamilton Counties, Diphtheria in..... 115
Gardener, Prof. James J..... 188
Geneva, Report on Diphtheria in.....17, 141
Map of..... 143
Work of its Board of Health..... 149
Hallett, Dr. A. P.....139, 141
Harmony, Diphtheria in..... 138
Harris, Dr. E.....71, 104, 188
Hart's Falls, Malaria at..... 190
Health Officer of Port of New York..... 54
Hewlett, Dr. W. W., Report from 164–167
House-Epidemics.....174–180
Hunt, Dr. James G.....66, 188, 189
Husted, Dr. N. C., Prest. Tarrytown Board Health, Report..... 174
Institutions, Public, Report on 55–66
Ithaca, a Farm-house Epidemic 175
Johnstown, Diphtheria in.....117–126
Map of..... 119
Laurens, Diphtheria in..... 132
Laws, Public Health, Manual of.....9, 10
Long Island, Dysentery on..... 152
Maps and Diagrams of Arietta..... 108
of Babylon 167, 169
of Benson..... 114
of Geneva..... 148
illustrating House-Epidemics 158–161, 169, 177, 180
of Johnstown..... 119
of Morris and Laurens..... 133
of Northville..... 128
of Otsego county..... 180
of Southampton 155
of Tarrytown..... 173
of Utica Asylum 56–60
of Waterville, Oneida county..... 136
of Wells..... 116
Malaria 20, 181, 182, 184–191
Mattison, Dr. M., Report by.....132–135
Membership 4
Meetings of the Board..... 9
Millport, Sickness Caused by Abandonment of Canal..... 183
Minutes of the Board, Abstract of 86–92
of First Meeting..... 86
of Second Meeting..... 86
of Third Meeting (Special) at Buffalo..... 88
of First Quarterly Meeting 89

PAGE.
Minutes of Special Meeting September 22.....89–90
of Second Quarterly Meeting..... 91
of Special Meeting November 27..... 92
Moore, Dr. E. M.....71, 188
Morris and Laurens, Diphtheria in..... 132
Map..... 133
Northville, Diphtheria in..... 126
Map of..... 128
Nuisances, Regulations and orders against.....70–74
Officers of the Board.....4, 7
Palmer, Elton..... 182
Port of New York.....39, 40
Potter, Dr. Z. H..... 176
Post, Dr. George M..... 186
Quarantine, Report of Standing Committee on..... 31
Sketch of Early Laws..... 33
External..... 31
Internal..... 46
Registration of Vital Statistics.....11, 28, 29, 96–103
Regulations, Model Sanitary..... 71
Roy & Co., West Troy..... 16
Sanitary Legislation..... 67
Proposed Model Ordinances.....71–74
Schenectady, Petition of Citizens..... 189
Schuyler Co., Diphtheria in..... 139
Seaman, Dr. H..... 185
Secretary's Report, by.....93–198
Plan and Progress.....94–102
Relations with National and State Boards..... 103
Sanitary Investigations..... 103
Small-pox.....15–17, 192–199
Smelzer, Dr. B. T..... 187
Smith, Dr. Wm. M..... 54
Southampton, Epidemic of Dysentery..... 152
State, What it Owes to the People.....75–85
Tarrytown, Dysentery in..... 172
Map of..... 173
Troy, West, Outbreak of Small-pox..... 192
Vaccination, Statutes requiring it.....51–52, 192–199
Success and Examples of..... 16
Vital Statistics.....11, 28
Waldo, Dr. H. L..... 192
Ward, Hamilton, Attorney-General..... 70
Waterville, Diphtheria in..... 136
Water Supply..... 21
Wells and Well Water, Defilement of.....174, 176
Wells, Diphtheria in.....115, 116
Wilderness, Diphtheria in.....18, 126
Yonkers, Petition of Citizens..... 190